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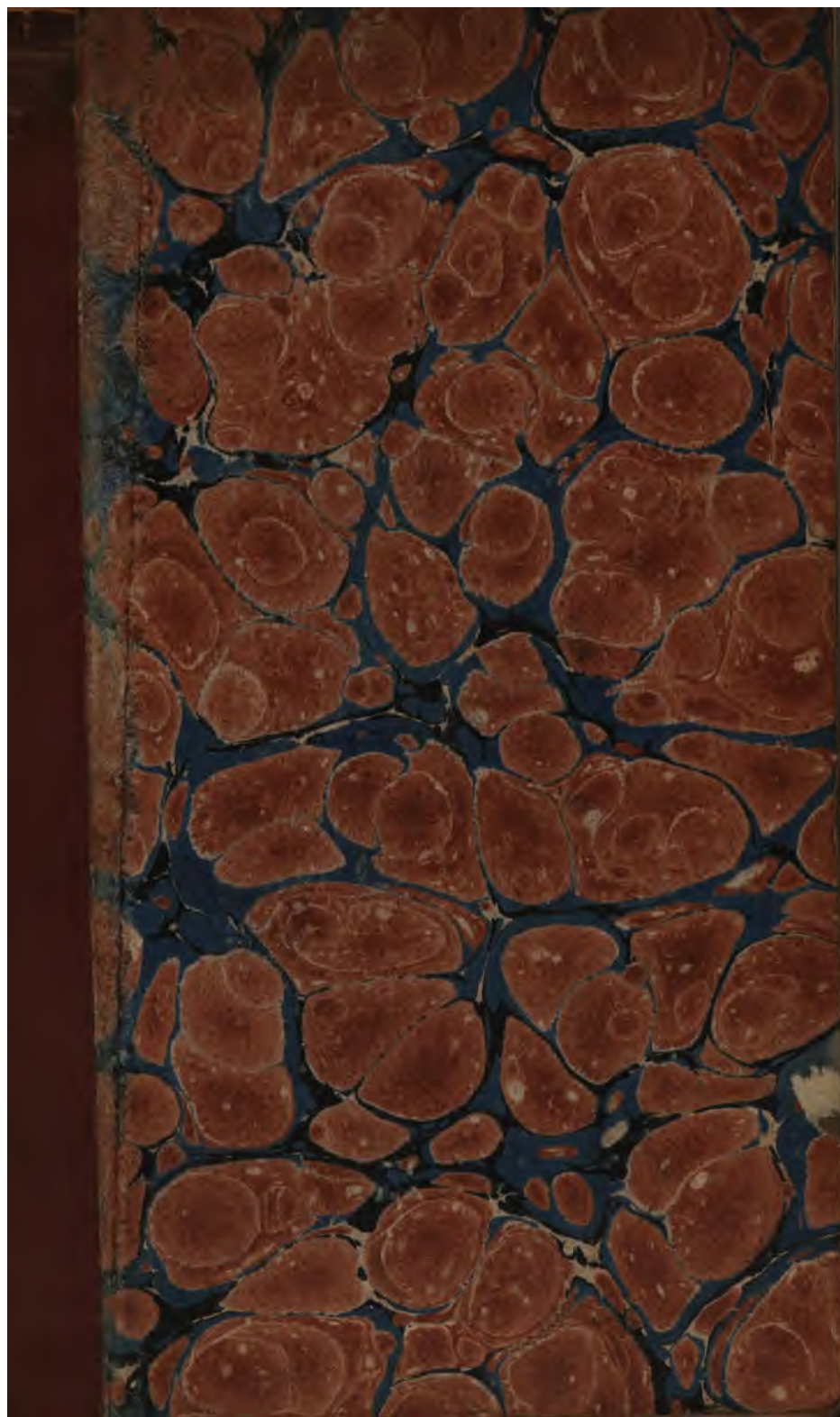
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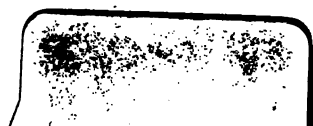
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THE  
ENGLISH CHANNEL PILOT,  
FOR THE  
SOUTH AND SOUTH-WEST COASTS OF  
ENGLAND,  
THE SOUTH COAST OF  
IRELAND,  
AND  
PART OF THE NORTH COAST OF FRANCE,

---

COMPILED FROM THE LATEST SURVEYS.



PUBLISHED BY CHARLES WILSON,  
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1878.

201. f. 62.

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*N.B.—Alterations and additional information will be given in supplementary pages of ADDENDA, as occasion may require; these corrections are also transferred at once to the Chart, which this book is intended to accompany, so that generally the Chart has the latest information.*

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ANY REMARKS OR COMMUNICATIONS FROM OUR NAUTICAL FRIENDS FOR THE FUTURE  
IMPROVEMENT OF THIS, OR OTHER OF OUR WORKS,  
ARE RESPECTFULLY SOLICITED.

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#### ALTERATION.

**Brixham**, p. 64.—From the 1st June, 1878, the red light on the inner pier head will be discontinued, and a *fixed green* light will be shown in its place; also a *fixed red* light, visible 3 miles, will be shown from the new works at the end of the break-water.

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## INTRODUCTORY REMARKS.

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IT has been considered advisable to commence the directions of the "Channel Pilot" at the North Foreland; for although the English Channel may be said to commence at the Strait of Dover, the Downs generally is the place where pilots from the Thames disembark; and as many homeward-bound vessels may be compelled to run from the English Channel to the Downs without a pilot, such directions appear to be a necessary appendage to those of the Channel; but for the southern channels of the Thames to the Nore, and from thence to London Bridge, the mariner is respectfully referred to the Book of Directions for the River Thames and its Entrances, which accompanies the large Chart of the River Thames, commencing at London Bridge, and describing the navigation to the Downs and Orfordness; and, without such Chart, no person, unless locally acquainted, should attempt its narrow channels and intricate tidal navigation.

Before commencing the description of the Coast and Harbours, or the practical Directions for Sailing, we have introduced a short TABLE of LATITUDE and LONGITUDE for the principal points or headlands in the English Channel, &c.; a TIDE TABLE, showing the time of High Water, with the rise of Tide; also a TABLE of the BEARINGS and DISTANCES of the principal headlands, &c., with the depths of water that vessels should stand in to and off shore; then an extended LIST of BEARINGS and DISTANCES, with the TRUE and MAGNETIC COURSES, and the Mean Variation of the Compass to the present year. A few OBSERVATIONS on the STORMS in the ENGLISH CHANNEL follow before taking up the description.

Towards the end of the Work will be found GENERAL DIRECTIONS for SAILING UP the ENGLISH CHANNEL, with an account of WINDS, CURRENTS, &c., and a TABLE of THWART BEARINGS and DISTANCES up the CHANNEL, commencing at Ushant, also a list of Light-houses and Light-vessels.

This edition of the Work has been carefully brought up to the present time, and such alteration and correction adopted that seemed desirable to make the text clear and useful to the seaman. All extraneous matter has been avoided, so that in navigating along the Coast only such description as is really useful to piloting his vessel should have the mariner's attention, and this has in all cases been made as concise as the nature of such information will admit.

**LIFE BOAT STATIONS**, at all of which the mariner may depend upon a ready assistance immediately a vessel is observed to be in distress.

**Kent.**—Margate, Kingsgate, Broadstairs, Ramsgate, North Deal, Walmer, Kingsdown, Dover, Dungeness.

**Sussex.**—Rye, Winchelsea, Hastings, Eastbourne, Newhaven, Brighton, Shoreham, Worthing, Selsea, Chichester Harbour.

**Hampshire.**—Hayling Island.

**Isle of Wight.**—Bembridge, Brighstone Grange, Brooke.

**Alderney.**—St. Anne.

**Guernsey.**—St. Samson's.

**Dorset.**—Poole, Chapman's Pool, Kimeridge, Weymouth, Lyme Regis.

**South Devon.**—Sidmouth, Exmouth, Teignmouth, Brixham, Salcombe, Plymouth.

**Cornwall.**—Looe, Fowey, Mevagissey, Portloe, Falmouth, Porthoustock, Cadgwith, Lizard, Mullion, Porthleven, Penzance, Lennen or Lelland Cove, St. Ives, Hayle, New Quay, Padstow, Port Isaac, Bude.

### IRELAND.

**Wexford.**—Courtown, Cahore, Wexford (two boats), Carnsore, Duncannon.

**Waterford.**—Tramore, Dungarvan, Ardmore.

**Cork.**—Youghal, Ballycotton, Queenstown, Courtmacsherry.

**Kerry.**—Valentia.

### FOG SIGNALS ON THE SOUTH COAST OF ENGLAND.

*The following signals are those in use in July, 1878. Alterations may be made, particularly as the explosive rockets are coming into use:—*

**South Sand Head.**—A trumpet will sound a blast of five seconds duration every two minutes.

**Dungeness.**—Two blasts in quick succession every two minutes.

**Owers Light-vessel.**—Six blasts every minute.

**St. Catherine's Point.**—Isle of Wight, two blasts in quick succession every four minutes.

**Portland.**—During thick or foggy weather a bell will be sounded from the break-water light-house at intervals of 39, 28, 27, 37, 18, and 20 seconds.

**Shambles Light-vessel.**—One blast every two minutes.

**Casquets.**—Three blasts of two seconds duration each, in quick succession every five minutes.

**Start Point Light-house.**—One blast every three minutes.

**Eddystone.**—Bell sounded five times in quick succession every half minute.

**St. Anthony's Point.**—A bell is struck four times every alternate half minute.

**The Lizard.**—One blast every five minutes.

**Wolf.**—A bell gives three strokes every quarter of a minute.

**Longships.**—A bell sounded twice every quarter of a minute.

**Seven Stones.**—The blasts will be emitted at intervals of ten seconds, and distributed over all points of the compass.

**Bishop, Scilly Island.**—A bell sounded every ten seconds.

SAILING DIRECTIONS  
FOR  
THE ENGLISH CHANNEL,  
ETC.

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NOTICES.

In this work the Soundings are at LOW WATER, Spring-tides; the Bearings and Courses are Magnetic, or by Compass; and the distances are in nautical Miles of 60 to a Degree. A Cable's length equal to 100 fathoms. Longitude from Greenwich.

The Mean Magnetic Variation is as follows:—In the Downs and off the South Foreland  $18\frac{1}{4}^{\circ}$ ; off St. Catherine's Point,  $20^{\circ}$ ; and off Scilly,  $23^{\circ} 20'$  West, or from  $1\frac{1}{2}$  Point to 2 Points West.

**PILOTAGE.**—No London Pilot is licensed to take charge of vessels beyond the Isle of Wight, and some only as far as Dungeness. It is, therefore, necessary when employing a Pilot to ascertain by his licence the limits for which he is authorised to pilot a vessel, in order that the Master may be acquainted with the point at which his own responsibility commences.

By a regulation of the Trinity House, all buoys placed over or near the wrecks of sunken vessels are nun buoys, painted green and marked with the word "WRECK," in order to distinguish them from the regular direction buoys, but these remain only until the wrecks have been removed or dispersed.

Light-vessels are distinguished in the day-time by a red ball or balls at the mast heads, which in the event of the vessels driving from their proper stations will be struck. Each vessel is provided with a gong or fog signal, to be sounded in foggy weather. In some instances the fog horn, or trumpet, is being introduced; A gun is fired when vessels are observed standing into danger. In order the better to determine the direction in which light ships are riding, a white riding light will be exhibited from sunset to sunrise from the forestay of each vessel, at a height of 6 feet above the rail.

TABLE OF LATITUDE, AND LONGITUDE OF THE  
PRINCIPAL POINTS, &c.

PLACE.		LATITUDE.	LONGITUDE.
North Foreland Light-house.....		51 22 28 N.	1 26 48 E.
South Foreland High Light-house .....		51 8 23 "	1 22 22 "
Coast of France.	{ Cape Grisnez Light-house ...	50 52 10 "	1 34 56 "
	{ Boulogne S.W. Jetty .....	50 43 56 "	1 35 5 "
	{ Cape d'Alprech Light-house	50 41 57 "	1 33 41 "
	{ Point de L'Ornel Light-house	50 33 38 "	1 34 36 "
Varne Light-vessel.....		50 56 18 "	1 16 20 "
Dungeness Light-house.....		50 54 47 "	0 58 18 "
Beachy Head Light-house .....		50 44 15 "	0 12 58 "
Owers Light-vessel.....		58 38 50 "	0 40 0 W.
Nab Light-vessel .....		50 42 15 "	0 59 20 "
St. Catherine's Light-house .....		50 34 30 "	1 17 47 "
Needles Light-house .....		50 39 42 "	1 35 27 "
Durlston Point .....		50 35 38 "	1 57 0 "
Portland Upper Light-house.....		50 31 18 "	2 27 18 "
Berry Head, Tor Bay.....		50 24 0 "	3 29 0 "
Dartmouth, St. Petrox Castle .....		50 20 0 "	3 33 0 "
Start Point Light-house.....		50 13 18 "	3 38 28 "
Eddystone Light-house .....		50 10 49 "	4 15 53 "
Plymouth, Dial on Breakwater.....		50 19 59 "	4 8 52 "
Dodman Point.....		50 13 0 "	4 48 0 "
St. Anthony Point Light-house .....		50 8 0 "	5 1 0 "
Lizard, Eastern Light-house.....		49 57 39 "	5 12 6 "
Wolf Rock Light-house.....		49 56 43 "	5 48 27 "
Longships Light-house .....		50 3 58 "	5 44 45 "
Scilly Is.	{ Bishop Light-house.....	49 52 23 "	6 26 40 "
	{ St. Agnes Light-house.....	49 53 33 "	6 20 38 "
Seven Stones Light-vessel.....		50 3 37 "	6 4 37 "
Godrevy Island Light-house ( <i>St. Ives</i> )		50 14 0 "	5 24 0 "
Trevose Head High Light-house.....		50 32 55 "	5 2 3 "
Tintagel Head.....		50 39 48 "	4 45 30 "
Hartland Point .....		51 1 24 "	4 31 30 "
Coast of France.	{ Cape Barfleur Lt.-ho.,revo.Lt.	49 41 50 "	1 16 2 "
	{ Cape La Hague Lt.-ho.,fix.Lt.	49 43 22 "	1 57 21 "
	{ Caskets Light-ho. flashg. Lt.	49 43 17 "	2 22 42 "
	{ Hanois Lt.-ho. revolving Lt. (Guernsey) .....	49 26 2 "	2 42 10 "
<i>Ushant, Point Creach Lt.-ho. flashing Lt.</i>		48 27 34 "	5 7 52 "



# TIDE TABLE FOR THE ENGLISH CHANNEL.

Showing the time of High Water on the Full and Change days of the Moon : with the Rise of the Tide at the Springs and Neaps.\*

PLACE.	High Water F. & C.	RISE.		PLACE.	H. W. F. & C.	RISE.	
		Springs. ft. in.	Neaps. ft. in.			Springs. ft. in.	Neaps. ft. in.
Ramsgate Harbour	h. m. 11 39	15 0	12 0	Portland Breakwtr.	h. m. 7 1	6 9	4 6
Deal .....	11 15	16 0	12 6	Chisil Bay .....	6 13	10 3	7 0
Dover Harbour ..	11 12	18 9	15 0	Bridport .....	6 5	11 3	7 9
Folkstone Harbour	11 7	20 0	16 6	Lyme Regis .....	6 21	11 6	8 6
Dungeness .....	10 45	21 9	19 0	Exmouth .....	6 21	12 3	8 6
Rye Bay .....	11 20	22 0	17 3	Teignmouth .....	6 0	13 0	9 6
Hastings .....	11 53	24 0	17 6	Tor Bay.....	6 0	13 6	10 0
Beachy Head .....	11 20	20 0	15 0	Dartmouth .....	6 16	14 3	10 6
Newhaven .....	11 51	20 0	15 0	Salcombe .....	5 41	15 0	11 6
Shoreham.....	11 34	18 0	13 3	———, Kings } bridge .....	5 46	10 0	——
Little Hampton ...	11 36	16 0	11 6	Eddystone .....	5 15	16 0	12 0
Selsea Bill .....	11 45	16 6	12 6	Plymouth Breakwr.	5 37	15 6	11 6
Chichester .....	11 30	14 0	11 0	Devonport Dockyd.	5 43	15 6	11 6
Bembridge Point...	11 0	14 0	10 6	Saltash .....	5 45	15 0	11 0
Portsmouth Dockyd.	11 41	12 6	10 0	East Looe.....	5 26	16 0	13 0
Spithead .....	11 20	14 0	10 3	Fowey .....	5 14	15 0	11 9
Southampton .....	{ 10 30	13 0	9 6	Mevagizey .....	5 4	15 6	12 0
	{ 12 45			Lizard .....	5 0	14 3	10 6
Red-bridge .....	{ 10 42	8 6	6 0	Penzance .....	4 30	16 3	12 6
	{ 12 57			Cape Cornwall.....	4 35	18 0	13 0
Calshot Castle .....	11 30	13 0	9 6	Scilly (St. Mary's)..	4 18	15 9	11 9
West Cowes.....	{ 10 45	12 6	9 6	Scilly Id. (S. Agnes)	4 30	16 0	12 0
	{ 11 45			St. Ives .....	4 44	21 0	15 0
Yarmouth .....	{ 10 0	7 0	6 6	Padstow .....	5 13	20 6	16 3
	{ 12 0			Budehaven .....	5 45	23 0	17 0
Needles Point .....	9 46	7 6	5 0				
Christchurch .....	{ 9 0	5 0	——				
	{ 11 30						
Poole.....	{ 9 10	6 6	4 9				
	{ 12 45						

\* By the rise of Tide, is meant its vertical rise above the mean L.W. level of Spring-tides.

**A TABLE OF THE BEARINGS AND DISTANCES**  
**OF THE**  
**PRINCIPAL HEADLANDS, &c., IN THE ENGLISH CHANNEL,**  
**WITH THE**  
**Depths of Water Ships should stand to in-Shore and the Offing.**

NAMES OF HEADLANDS.	Magnetic Bearings.	Distance in Miles.	Shore Fathoms.	Offing Fathoms.
From the N. Foreland to the S. Foreland	S.W. by S. $\frac{1}{4}$ S.	15		
South Foreland to Dungeness .....	W.S.W.	20 $\frac{1}{2}$	12 & 14	16
Dungeness to Beachy Head .....	W. $\frac{1}{4}$ S.	29 $\frac{1}{2}$	12 & 18	20
Beachy Head to Selsea Bill .....	W.N.W. $\frac{1}{4}$ W.	39	18	28
to Dunnose .....	W. by N.	55	18	30
Dunnose to St. Catherine's Point .....	West.	4 $\frac{3}{4}$		
to the Elbow of the Owers...	E. by S.	19	18	30
St. Catherine's Pt. to St. Alban's Head	W. by N. $\frac{3}{4}$ N.	29	22	35
to the Bill of Portland	W. by N. $\frac{1}{4}$ N.	44 $\frac{1}{2}$	22	36
The Bill of Portland to Berry Head...	W. by N.	39 $\frac{1}{2}$		
to the Start .....	W.	49	27	36
Bolt Head to the Rame Head .....	N.W. $\frac{1}{2}$ W.	18		
to the Eddystone .....	W.N.W. $\frac{1}{2}$ W.	18	32	46
to the Lizard.....	W. $\frac{1}{2}$ N.	57		
Rame Head to the Lizard .....	W. $\frac{3}{4}$ S.	43	40	46
Lizard to the Rundle Stone .....	N.W. by W.	18 $\frac{1}{2}$	46	
to the Wolf Rock .....	W. by N. $\frac{3}{4}$ N.	23 $\frac{1}{2}$		
The Longships to the Wolf Rock.....	S.W. $\frac{1}{4}$ S.	7 $\frac{1}{2}$		
to St. Agnes Light ...	W. $\frac{1}{4}$ S.	25		
to the Seven Stones...	W. by N. $\frac{3}{4}$ N.	13		
to the Brisons .....	N.E. $\frac{3}{4}$ N.	3 $\frac{1}{4}$		

\*\* See also general Directions for Sailing into and up the English Channel at the end of the Work.

# BEARINGS AND DISTANCES IN THE ENGLISH CHANNEL.

FROM	TO	True Bearing.	Mean Variation.	Magnetic Bearing.	Distance Nautical Miles.
SOUTH FORELAND LOW LIGHT	Calais Pier Head .....	S. 61° E.	18½° W.	S. 42½° E. = S.E. ¼ S.	28
"	Cape Grisnez Light .....	S. 27 E.	18½	S. 8½ E. = S. ¾ E.	18
"	Boulogne Pier Head.....	S. 19 E.	18½	S. = South	26
DUNGENESS .....	Folkestone.....	N. 40 E.	18½	N. 58½ E. = N.E. by E. ¼ E.	13
"	South Foreland Low Lt.	N. 49 E.	18½	N. 67½ E. = E.N.E.	20½
"	Cape Grisnez.....	S. 84 E.	18½	S. 65½ E. = S.E. by E. ¾ E.	22½
"	Cape d'Ailly Light .....	S. 1 W.	18½	S. 19½ W. = S. by W. ¾ W.	60
"	Dieppe .....	S. 5 E.	18½	S. 13½ W. = S. by W. ¼ W.	60
ROYAL SOVEREIGN SHOALS } LIGHT-VESSEL .....	Dungeness .....	N. 63 E.	19	N. 82 E. = E. ¾ N.	23½
BEACHY HEAD.....	Dungeness.....	N. 68 E.	19	N. 87 E. = E. ¼ N.	29½
"	Royal Sovereign Shoals Light-vessel .....	S. 84 E.	19	S. 65 E. = S.E. by E. ¾ E.	7
"	Cape Grisnez .....	N. 79 E.	19	S. 82 E. = E. ¾ S.	51
"	Owers Light .....	S. 81½ W.	19½	N. 79 W. = W. by N.	35½
NAB LIGHT-VESSEL.....	Boulder Bk. S. W. Elbow	S. 75½ E.	19½	S. 56 E. = S.E. by E.	6½
"	Owers Light .....	S. 72½ E.	19½	S. 53 E. = S.E. ¾ E.	12½
"	Dunnose.....	N. 70 E.	20	S. 90 E. East	4½
CATHERINE'S LIGHT ...	Owers Light .....	N. 78 E.	20	S. 82 E. = E. ¾ S.	24
St.	Beachy Head.....	N. 81½ E.	19½	S. 79½ E. = E. by S.	60
"	Caskets .....	S. 39 W.	20	S. 59 W. = S.W. by W. ¼ W.	66
"	Needles Rock, Light ...	N. 65 W.	20	N. 45 W. = N.W.	12½

# BEARINGS AND DISTANCES IN THE ENGLISH CHANNEL.—(Continued.)

FROM.	TO.	True Course.	Mean Variation.	Magnetic Course.	Distance Nautical Miles.
DURLSTON HEAD .....	Needles Rock Light.....	N. 72½ E.	20½° W.	S. 87 E. = E. ½ S.	14½
" .....	St. Catherine's Light ...	S. 88½ E.	20½	S. 68 E. = E.S.E.	25
" .....	Cherbourg, W. end of Breakwater .....	S. 12½ E.	20½	S. 8 W. = S. ½ W.	57
" .....	Caskets Light .....	S. 16½ W.	20½	S. 37 W. = S.W. ¾ S.	55
SHAMBLE LIGHT-VESSEL.....	Durlston Head .....	N. 72½ E.	20½	S. 87 E. = E. ½ S.	15½
" .....	Needles Rock Light.....	N. 72½ E.	20½	S. 87 E. = E. ½ S.	29½
" .....	St. Catherine's Light ...	N. 83½ E.	20½	S. 76 E. = E. by S. ½ S.	39½
PORTLAND BILL .....	Durlston Head .....	N. 75½ E.	20½	S. 84 E. = E. ½ S.	20
" .....	St. Catherine's Light ...	N. 83½ E.	20½	S. 76 E. = E. by S. ½ S.	44½
" .....	Shambles Light .....	S. 89½ E.	20½	S. 70 E. = E. by S. ½ S.	4½
" .....	Cherbourg W. End of Breakwater .....	S. 31½ E.	20½	S. 11 E. = S. by E.	59
" .....	Caskets Light .....	S. 3½ E.	20½	S. 17 W. = S. by W. ¾ W.	47
" .....	Ushant W. Light.....	S. 41½ W.	20½	S. 62 W. = S.W. by W. ¾ W.	160
" .....	Berry Head .....	S. 80½ W.	20½	N. 79 W. = W. by N.	39½
START POINT LIGHT .....	Berry Head .....	N. 32 E.	21	N. 53 E. = N.E. ¾ E.	12½
" .....	Mewstone, Dartmouth...	N. 35 E.	21	N. 56 E. = N.E. ½ E.	8
" .....	Portland Bill.....	N. 69½ E.	20½	N. 90 E. = East.	49
" .....	Shambles Light .....	N. 69½ E.	20½	N. 90 E. = East, southerly	53
" .....	St. Catherine's Light ...	N. 77½ E.	20½	S. 82 E. = E. ¾ S.	92
" .....	Caskets Light .....	S. 59½ E.	20½	S. 39 E. = S.E. ½ S.	56
" .....	Ushant W. Light.....	S. 30 W.	21	S. 51 W. = S.W. ¾ W.	119

EDDYSTONE LIGHT .....	St. Anthony's Lt.-house .....	S. 85½ W.	21½	N. 73° W.	=	W. by N. ¼ N.	29
" .....	Rame Head .....	N. 12½ E.	21½	N. 34 E.	=	N.E. by N.	8
" .....	Breakwater Light-house .....	N. 23½ E.	21½	N. 45 E.	=	N.E.	10
" .....	Lizard Head .....	S. 69 W.	21	N. 90 W.	=	West.	39
" .....	Prawle Point .....	N. 86 E.	21	S. 73 E.	=	E. by S. ½ S.	21
" .....	Caskets Light .....	S. 68½ E.	20½	S. 48 E.	=	S.E. ¼ E.	77
" .....	Ushant W. Light .....	S. 18 W.	21	S. 39 W.	=	S.W. ¼ S.	108
LIZARD LIGHTS .....	Rame Head .....	N. 76½ E.	21½	N. 82 E.	=	E. ¾ N.	43½
" .....	Eddystone Light .....	N. 68½ E.	21½	N. 90 E.	=	East.	39
" .....	Start Point Light .....	N. 74½ E.	21½	S. 84 E.	=	E. ½ S.	63
" .....	Beachy Head Light .....	N. 78 E.	20	S. 82 E.	=	E. ¾ S.	215
" .....	Caskets Light .....	S. 80 E.	21	S. 59 E.	=	S.E. by E. ¼ E.	108
" .....	Ushant W. Light .....	S. 1½ E.	21½	S. 20 W.	=	S. by W. ¾ W.	88
" .....	Wolf Rock Light .....	S. 88½ E.	21½	N. 70 W.	=	W. by N. ¾ N.	23½
" .....	Rundlestone Rock .....	N. 77½ W.	21½	N. 56 W.	=	N.W. by W.	18½
LONGSHIPS LIGHT .....	Wolf Rock Light .....	S. 20 W.	22	S. 42 W.	=	S.W. ¼ S.	7½
" .....	Seven Stones Light .....	S. 88 W.	22	N. 70 W.	=	W. by N. ¾ N.	13
" .....	Rundlestone Rock .....	S. 45 E.	22	S. 23 E.	=	S.S.E.	4
SULLY, ST. AGNES LT. ....	Western Land's End .....	N. 68 E.	22	N. 90 E.	=	East.	26½
" .....	Tol Peden Penwith .....	N. 76 E.	22	S. 82 E.	=	E. ¾ S.	27
" .....	Lizard Lights .....	N. 85 E.	22	S. 73 E.	=	E. by S. ½ S.	44½
" .....	Caskets Light .....	S. 86 E.	21	S. 65 E.	=	S.E. by E. ¾ E.	154
" .....	Ushant W. Light .....	S. 28 E.	22	S. 6 E.	=	S. ½ E.	96½
" .....	Wolf Rock Light .....	N. 82 E.	22	S. 76 E.	=	E. by S. ¼ S.	21

## OBSERVATIONS ON STORMS IN THE ENGLISH CHANNEL.

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Of the storms incident to the English Channel, experience has proved that those from S.E. to S.S.W. are the most dangerous ; while those from the west, N.E., or E.N.E., are seldom so destructive.

Should a storm arise suddenly, with the wind N.E., vessels riding in the Downs will get under way immediately, and proceed down Channel ; or, if homeward-bound, and unable to ride out the gale, they can slip, and run for the Mother Bank or Portsmouth Harbour.

When the wind blows hard from the S.E. to the S.S.W., vessels in the Downs will ride very heavily ; for those winds drive in a heavy sea, and ships often bring up too near each other to allow for contingencies. A good scope of cable should always be veered in time, for the greatest strength of the tide generally happens at H.W., when there is the most sea ; besides, the ground is so cut up by anchors, that it is not very good for holding.

Small vessels, during the winter season, should never risk a night in the Downs, but proceed to Ramsgate Harbour at once, even if the weather does not look bad, as the sudden manner in which southerly gales come on in the Downs at this season of the year, is too well known to require any remark. By not using the above precaution, numbers of anchors and cables are left in the Downs, when compelled to run for Ramsgate in the midst of a gale.

Ramsgate Harbour is well conducted, and every assistance is rendered when approaching the piers ; and a few shillings' pilotage is only a minor consideration, when compared with the risk run in hazarding a night in the Downs, in winter-time, in a small vessel.

Vessels meeting with heavy gales of wind from the S.W. before they are clear of the Channel, will find Plymouth Sound, Torbay, and Portland Harbour excellent roadsteads in such winds, and which may be taken without a pilot, being easy of access for any class of ships. Should the weather be so thick that you cannot run for a place of shelter with safety, to keep a good offing is always preferable to running an unwarrantable risk, perhaps only to avoid a temporary gale.

Although a knowledge of the Channel Harbours, in cases of necessity, might prove of the greatest importance, yet we do not recommend them to outward-bound vessels,—only in cases of emergency ; for, by keeping a good offing, should the wind get round to the south, a few hours might enable them to clear the Channel, and ensure a passage across the Atlantic, when ships in the Channel *Harbours might be detained for weeks.*

# THE DOWNS.

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## FROM THE NORTH FORELAND,

TO

## RAMSGATE, DEAL, DOVER, &c.

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### Description of the Sands, Lights, &c.

THE OUTER track for large ships to the Downs is through the Gull Stream, which is bounded on the eastern side by the Goodwin Sands, and on the western side by the Elbow, Gull, North Bar, and Brake Sands.

THE Inner Channel is used by small vessels, and is to the westward of the Elbow and Gull Shoals. In this passage there are numerous small knolls of shallow water, which were formerly designated under various names, but from the new surveys, a much better, and more useful acquaintance may be made by a reference to the chart, and observation of the depths of water there given.

THE GOODWIN SAND is extensive and dangerous, is very shoal, and a great part dries at low water; on the western side is TRINITY BAY, a deep inlet running in a N.E. direction from the Bunt Head buoy, with a depth of 9 and 10 fathoms at its entrance, which divides the sand into the North and South Goodwin. At the N.E. part of the South Goodwin is a dry sand, upon which is the Safety beacon; and S.W. by W. from this there are several dry patches, called the South Callipers; these form the south-eastern boundary of the Goodwin Sands, and are steep-to.

THE NORTH GOODWIN is about 3 miles long and 3 broad; its edge is steep-to, and dries. On the N.W. side of Trinity Bay is a sandy spit, called the Fork, which extends S.W. by W.  $\frac{1}{2}$  W.,  $1\frac{1}{2}$  mile; the western part of the spit is named the Bunt Head, and has only 8 feet on it. The North Goodwin dries, and bends circularly to the eastward, forming the northern and eastern edges of the Goodwin.

GOODWIN KNOLL AND BUOY. This knoll is of very considerable extent, to the northward of the north end of the Goodwin Sands, much in the way of vessels passing into and out of the Gull Stream, and having 8, 9, and 10 feet on some parts of it. A black buoy is laid down near the north-western edge, in 5 fathoms, with North Foreland light-house N.N.W.  $\frac{3}{4}$  W.; Gull buoy N.W.  $\frac{1}{4}$  W.; and the Goodwin light-vessel E.  $\frac{1}{4}$  N. From this buoy the shoal water of 26 to 30 feet stretches N.E. half a mile, forming the North Sand-head.

Goodwin Light-vessel shows a bright light revolving in one minute, giving three flashes in quick succession, followed by an interval of 36 seconds of darkness; it lies in 10-fathoms N.E., nearly 2 miles from the nearest part of the North Goodwin, with the North Foreland light-house N.W.  $\frac{1}{4}$  N., 6 miles; Ramsgate Pier light-house W. by N.  $\frac{1}{4}$  N., 6 miles; and the Gull buoy, W. by N.  $\frac{1}{4}$  N.,  $2\frac{1}{2}$  miles. This vessel carries 3 balls one at each mast-head.

[E. CHANNEL.]

The situation of this light-vessel renders it impossible for vessels to get upon the North Sand Head, or any part of the Goodwin, if proper attention be paid to the three following short and clear directions viz:—

1st. The intention of the Goodwin light being to keep vessels to the eastward of the Goodwin, masters of all ships and vessels in coming from the North Sea towards the Strait of Dover, must be careful not to bring the Goodwin light to bear more southerly than S.S.W.; but, on the contrary, should always keep the light rather to the westward than to the southward or eastward of that bearing, while they are to the northward of it, and they will be sure then to pass far enough to the eastward of every part of the Goodwin, by steering a S. by W. course after they have passed the light.

2nd. The masters of vessels coming from the Strait of Dover towards the North Sea must be careful not to shape a northerly course until the Goodwin light bears N. by E.; but, on the contrary, they should always keep the light rather to the northward than to the eastward of that bearing while they are to the southward of them, and they will be sure to pass far enough to the eastward of every part of the Goodwin.

3rd. Should any vessel coming from the North Sea towards Dover Strait be prevented by wind or tide, or otherwise, from proceeding to the southward, at the back of the Goodwin, or to the eastward, the master can, by a single bearing of the Goodwin light, anchor under the North Sand Head, in 6 or 7 fathoms clean ground, and ride there as safely as the light-vessel does; in order to do which he should keep to the northward of the light-vessel; and when that bears nearly south, anchor  $1\frac{1}{2}$  mile from her. Or should he prefer getting to the westward of the Goodwin, so as to have the Gull Stream open, he may run into the northward of the Goodwin upon a N.W. course until he judges he has run  $2\frac{1}{2}$  or 3 miles within, or to the N.W. of the light, and then anchor in 7 or 8 fathoms, light bearing S.E.

N.W. GOODWIN Buoy, black, in 12 fathoms lies off the N.W. edge of the North Goodwin, with the Gull light-vessel S.W. by W.  $\frac{3}{4}$  W., distant  $1\frac{1}{2}$  mile, and Middle Brake buoy W.N.W.,  $1\frac{1}{2}$  mile.

The GULL STREAM Light-vessel is moored in 8 fathoms, in the Gull Stream, about a mile north of that part of the Goodwin called the BUNT HEAD. This vessel shows a quick revolving light every 20 seconds, elevated 36 feet, and visible 7 miles; a red ball at the masthead.

This vessel lies with South Foreland high light over the middle of Old Stairs bay, S.W.; Middle Brake buoy N. by W.  $\frac{1}{4}$  W., distant  $1\frac{1}{2}$  mile; Gull buoy N.E., distant 4 miles; Bunt Head buoy S.S.W., distant  $2\frac{1}{2}$  miles; South Brake buoy S.W. by W., distant  $1\frac{1}{2}$  mile.

N.B.—When coming from the northward, by keeping the Gull light-vessel in line with the South Foreland high light S.W., will lead outside and near the light-vessel, which must be passed to the westward.

N.W. BUNT Buoy, black, in 5 fathoms; with Gull light-vessel N. by E., nearly  $1\frac{1}{2}$  mile; and Bunt Head buoy, S.W.  $\frac{3}{4}$  S.,  $1\frac{1}{2}$  mile.

BUNT HEAD Buoy, black, in  $5\frac{1}{2}$  fathoms, is placed on a spit of sand which projects into the Gull Stream, with Gull light-vessel N.N.E.,  $2\frac{1}{2}$  miles; South Brake buoy, N.  $\frac{3}{4}$  W., nearly  $1\frac{1}{2}$  mile; South Sand Head light-vessel, S. by W.  $\frac{3}{4}$  W.,  $4\frac{1}{2}$  miles.

SOUTH-WEST GOODWIN buoy, black, in 13 fathoms, with Bunt Head Buoy N. by E.  $2\frac{1}{2}$  miles, and South Sand Head light-vessel S.S.W.  $\frac{3}{4}$  W., nearly  $2\frac{1}{2}$  miles.

SOUTH SAND HEAD Light-vessel is moored off the South Sand Head of the Goodwin, in 14 fathoms, and shows one fixed bright light, with the South Foreland lights in line W. by N.; Varne light-vessel S.W.  $\frac{1}{4}$  W.,  $14\frac{1}{2}$  miles; East Goodwin light-vessel E. by N.  $\frac{1}{4}$  N.,  $6\frac{1}{2}$  miles; Deal Bank buoy, N.  $\frac{1}{4}$  E.,  $4\frac{1}{2}$  miles; and Bunt Head buoy N. by E.  $\frac{3}{4}$  E.,  $4\frac{1}{2}$  miles. A trumpet is sounded on board this light-vessel.



in lieu of the gong, in foggy weather; it will give a powerful blast of 5 seconds duration once every two minutes.

**WRECKS on the GOODWIN, &c.**—In cases of shipwreck, the following directions are to be carried into effect on board the light-vessels off the Goodwin.

If a vessel is on shore to the northward, a white rocket is to be discharged in a northerly direction, fired at an angle of  $45^{\circ}$ ; if to the southward, a red rocket is to be fired in a southerly direction at an angle of  $45^{\circ}$ . If to the eastward, a blue rocket is to be fired in a perpendicular direction.

**Buoys on the EAST SIDE, or BACK of the GOODWIN.**—The NORTH-EAST GOODWIN BUOY, striped black-and-white, lies in 12 fathoms, with Goodwin light-vessel N. by E.  $\frac{1}{2}$  E., 2 miles; and Goodwin Knoll buoy N.N.W.  $\frac{1}{2}$  W., 2 miles.

The EAST GOODWIN BUOY, chequered black-and-white, with St. Andrew's cross, lies in 19 fathoms, with the Goodwin light-vessel just open west of the N.E. Goodwin buoy, N. by E.  $\frac{1}{2}$  E.; and East Goodwin light-vessel S.  $\frac{3}{4}$  W.,  $2\frac{1}{2}$  miles.

The SOUTH-EAST GOODWIN BUOY, striped black-and-white, with staff and cage, lies in 17 fathoms, with the East Goodwin light-vessel E.S.E., 1 mile.

**EAST GOODWIN Light-vessel** lies in 30 fathoms  $1\frac{1}{2}$  mile from the edge of the sand, and shows a green revolving light, at intervals of 15 seconds. This vessel has a diamond-shaped beacon at the mast-head, surmounted by a half-diamond, and lies with South Sand Head light-vessel W. by S.  $\frac{1}{2}$  S.,  $6\frac{1}{2}$  miles; Goodwin Beacon, N.N.W.  $\frac{1}{4}$  W., 2 $\frac{1}{2}$  miles; and North Sand Head light-vessel, N. by E.  $\frac{1}{4}$  E.,  $6\frac{1}{2}$  miles.

The SOUTH GOODWIN BUOY, chequered black-and white, with staff and globe, lies in  $15\frac{1}{2}$  fathoms, with South Sand Head light-vessel W. by S.  $\frac{3}{4}$  S., 3 miles; and East Goodwin light-vessel E. by N.  $\frac{1}{2}$  N.,  $3\frac{1}{2}$  miles.

Masters of vessels and pilots are cautioned to give the above-mentioned buoys a berth of no less than half a mile in passing them, on account of the tide, which sets with great strength to the north-eastward, towards and over the sand.

**Safety Beacon.**—On the Goodwin Sands is 50 feet above the sand, and is furnished with steps for the purpose of climbing to the top in case of distress. It is situate in lat.  $51^{\circ} 14' 41''$ , nearly midway distant from the E. and S.E. Goodwin buoys.

## SHOALS, &c. ON THE WESTERN SIDE OF THE GULL STREAM.

The ELBOW is a small narrow shoal, having on its N.E. extremity a black-and-white vertically striped buoy, with staff and cage in  $4\frac{1}{2}$  fathoms, with the North Foreland light-house N.W. by W., distant  $2\frac{1}{2}$  miles, and the Gull buoy S. by W.  $\frac{1}{4}$  W.,  $2\frac{1}{2}$  miles. On this shoal there are from 18 to 23 feet, the shoalest part just within or westward of the buoy. This buoy is to be left on the starboard or west side, in pursuing the outer track for larger vessel towards the Downs.

**BROADSTAIRS KNOLL.**—The inner channel has only  $2\frac{1}{2}$  fathoms over it directly off Broadstairs, and is marked by a buoy, chequered black-and-white, in  $3\frac{1}{2}$  fathoms, with St. Peter's Church tower N.W.  $\frac{3}{4}$  W.; and Elbow buoy E. by N.  $\frac{1}{4}$  N., distant  $1\frac{1}{2}$  mile.

About a mile to the northward of the Knoll buoy, are three small patches of 16 and 18 feet, with 21 to 30 feet between them; these shoals lie midway in a line between the Elbow and North Foreland; the westernmost is three-quarters of a mile from the North Foreland, and the easternmost three-quarters of a mile from the Elbow buoy. They are dangerous for vessels drawing more than 16 feet. Vessels should pass to the eastward of the Knoll buoy and these shoals.

The GULL SAND is a narrow ridge, about a mile long, N.N.E. and S.S.W. ; on the middle is a shoal part of 18 feet, three-quarters of a mile S.S.E. from which is a conical buoy, chequered black-and-white, with the North Foreland light-house N.N.W. ; Gull light-vessel S.W., 4 miles ; North Bar buoy W.  $\frac{1}{2}$  S. 1 mile ; and North Sand Head light-vessel E. by S.  $\frac{1}{2}$  S. three-quarters of a mile. Ships may cross over the eastern end of the shoal in 4 fathoms, about one-third of a mile to the westward of the buoy ; but those of heavy draught should keep to the eastward.

The South Foreland high light in line with the Gull light-vessel leads to the westward of the Gull buoy.

NORTH BAR Buoy, black-and-white rings, is laid down on the shoalest part, in 2 fathoms, with Gull buoy E.  $\frac{1}{2}$  N. ; Gull Stream light-vessel S.W. by S. ; and Ramsgate pier light N.W. by W.

The BRAKE is a narrow but extensive sand, about N.E. by N. and S.W. by S.,  $4\frac{1}{2}$  miles long, with 3 feet only in some parts, and has a buoy at each end, and one in the middle, near its eastern side.

NORTH BRAKE Buoy, striped black-and-white, with North Bar buoy S.E. three-quarters of a mile ; and Ramsgate pier light N.W. by W.  $\frac{1}{2}$  W., nearly 2 miles.

OLD CUDD CHANNEL is marked by two buoys ; that on the northern side, the Dike, is black, and bears S.E. by E.  $\frac{1}{2}$  E., and that on the southern side, the Quern, is black-and-white, in chequers, and bears S.E.  $\frac{1}{4}$  E. from Ramsgate Pier, distant about three-quarters of a mile.

RAMSGATE Light-houses.—On the West pier-head a fixed red light is shown while 10 feet water in the harbour ; but when there are less than 10 feet the red light is changed from red to green. There are also green leading lights on the East and West Cliffs, as noticed in the directions p. 15.

On the East pier-head is a flashing light, 25 feet above the sea, illuminating an arc of  $224^{\circ}$  ; or from the direction of the Dike buoy round to the centre of the basin gates of the west entrance of the inner harbour ; the light revolves at equal intervals of 5 seconds light and 5 seconds dark, by which it will be readily distinguished from the town lights behind.

RAMSGATE CHANNEL.—NORTH FAIRWAY Buoy, striped red-and-white, is moored about W.S.W. from the entrance of the harbour, distant little more than one-third of a mile. This buoy should not be passed to the eastward or northward.

RATTLER or FAIRWAY Buoy, chequered red-and-white, in about 16 feet, with Ramsgate West light-house N.E. by N., and St. Peter's Church, Sandwich, W.  $\frac{1}{2}$  S.

SOUTH FAIRWAY Buoy, striped red-and-white, in the Ramsgate Channel, in 16 feet, with the south end of No. 2 Battery, W. by N.  $\frac{1}{2}$  N. ; Gull light-vessel S.E. by E.  $\frac{1}{2}$  E., 2 miles ; Rattler Fairway buoy N.  $\frac{1}{4}$  E., distant  $1\frac{1}{4}$  mile ; South Brake buoy S. by E.  $\frac{1}{2}$  E., distant  $1\frac{1}{2}$  mile.

MIDDLE BRAKE Buoy, chequered black-and-white, is placed about midway between the north and south buoys, on the eastern side of the sand, in 5 fathoms, with the Gull Stream light-vessel S. by E.  $\frac{1}{4}$  E., and the North Bar buoy, N.E. by E.  $2\frac{1}{2}$  miles.

SOUTH BREAK Buoy, conical, black-and-white rings, with staff and triangle, in 6 fathoms, with Deal Bank buoy S.W.  $\frac{1}{2}$  W.,  $1\frac{1}{2}$  mile ; Bunt Head buoy S.  $\frac{1}{2}$  E.,  $1\frac{1}{2}$  mile ; Gull light-vessel N.E. by E.,  $1\frac{1}{4}$  mile ; vessels should never attempt to cross the sand to the northward of the buoy.

DEAL BANK, off Deal town, about two-thirds of a mile from the shore, with not more than 16 feet on it in one part, having a channel within it of 4 to 5 fathoms ; a chequered black-and-white buoy is placed on a projecting point of sand, in 4 fathoms, with Upper Deal Church, just open to the southward of the

time ball tower, W.  $\frac{1}{4}$  N.; Bunt Head buoy E. by S.  $\frac{1}{4}$  S.,  $1\frac{1}{2}$  mile; and South Brake buoy N.E.  $\frac{1}{4}$  E.,  $1\frac{1}{2}$  mile.

A commodious pier has been run out at Deal, to the end of which pipes are laid for supplying ships with water; and boats may lie at the end at all times of tide, except dead low water, spring-tides, and fill their casks without risk.

**DEAL TIME BALL.**—The ball will be raised half-mast high at a few minutes before 1 o'clock, and will be raised at the top three minutes before one, every day. It will be dropped by an instantaneous galvanic current from the Royal Observatory, Greenwich, exactly at 1. The time to be noted, is the instant at which the ball begins to fall from the cross arms of the vane. If, in consequence of Galvanic accident, the ball is dropped too late or too soon, a black flag will be hoisted, till 15 minutes before 2; the ball will then be raised and dropped by hand at 2. If the wind is very heavy the ball will not be raised.

**SOUTH FORELAND Lights** are two brilliant fixed lights, bearing E.  $\frac{3}{4}$  S. and W.  $\frac{3}{4}$  N. of each other 449 yards. The high light is 372 feet above high water. The building is painted white, 69 feet high. This light is visible 26 miles.

The low light is 275 feet above high water, and visible 23 miles; the building is 49 feet high, painted white. The two light-houses in one form a mark to clear the South Sand Head.

In the neighbourhood of Folkestone, stand off shore when the high light disappears; but vessels drawing more than 14 feet should stand off when the low light disappears.

## MARGATE ROADS, AND FROM SEA TO THE DOWNS.

**DIRECTIONS.**—Vessels proceeding from MARGATE ROADS to the DOWNS should keep clear of the Long Nose Rocks, which stretch out from Foreness full half a mile, by passing to the northward of the striped black-and-white buoy, until the North Foreland light-house bears S.S.W.  $\frac{1}{4}$  W.; then steer S.S.E., according to the tide and distance from the Foreland, which will lead to the eastward of the striped beacon-buoy of the Elbow; in this track there are from  $5\frac{1}{2}$  to 8 fathoms. Having passed the buoy of the Elbow, leaving it about N.W., distant three-quarters of a mile, run S.S.W. for the leading mark through the Gull Stream, with the Gull light-vessel bearing S.W., and you will pass within a quarter of a mile of the Gull buoy. Pass the light-vessel on the west side, and a S.W. by S. course will take you through the Downs, and between the South Brake and Bunt Head buoys, and to a fair berth off the South Foreland.

In coming from sea, ships must not bring the Goodwin light-vessel to the eastward of S.E., until the Gull Stream light-vessel bears S.W.  $\frac{1}{4}$  W., and the North Foreland light-house N.W. by N. They will then have the Gull Stream open; and by steering S.W.  $\frac{1}{4}$  W. bring the Gull light-vessel N.E.; or being to the southward of the south Brake buoy, may run W.S.W. for an inshore berth in the Downs, or keep on a S.W. course for the Man-of-War's Roadstead.

Particular care and attention must be observed in taking the above bearings, and in steering, as the angles are small and the channel narrow, while sailing for the Downs in the night, and also in being unavoidably driven, or in sailing through the Gull Stream to the northward.

The buoys of the Gull, and the North Bar on the starboard, and the Goodwin light-vessel on the port side, will be a proper guide for the entrance to the Gull Stream; but do not approach too near to the Goodwin.

Small vessels proceeding through the INNER CHANNEL, or to the westward of Elbow and Gull Shoals for the DOWNS, should sail round the North Foreland &

before directed until the North Foreland light-house bears W. by S.  $1\frac{1}{4}$  mile ; then steer S.S.W.,  $8\frac{1}{2}$  miles, which will lead between the south Brake buoy and the Bunt Head ; whence proceed to the Downs. This track is to the eastward of the Broadstairs Knoll, and North Brake buoys. Small vessels only should adopt this passage to the westward of the Elbow and Gull Shoals.

Vessels leaving the Queen's or Prince's Channels, when abreast of the east buoy of Margate Sand, should steer about S.S.E. or S. by E.  $\frac{1}{4}$  E., until past the Elbow buoy, leaving it on the starboard side, and not going nearer than 3 cables' length. Being to the eastward of the Elbow buoy, about a mile, a S.S.W. course will lead to the eastward of the Gull Shoal, until the Gull Stream light-vessel bears S.W. In this direction proceed to the anchorage in the Downs, as above directed.

In working through the Gull Stream, bring the South Foreland upper light from cliff to cliff of Old Stairs Bay, keeping the lead always going, and stand towards the Goodwin, into 8 fathoms, and the Brake into 6 fathoms, so far as the Bunt Head. The Gull light-vessel is a good guide at all times, for the soundings are irregular.

## ANCHORAGE IN THE DOWNS, TO AND FROM RAMSGATE.

HAVING passed through the Gull Stream for the Downs, the marks for anchoring with a large ship are South Foreland high light-house on with the middle of Old Stairs Bay, and Upper Deal Mill on with Deal Castle, in 7, 8, or 9 fathoms, good holding clay ground. Moor with the best bower southward, so as to have an open hawse with southerly winds. If in the Downs in the night-time, and blowing hard from the S.S.E. or S., that you part your anchors, endeavour to bring the South Foreland high light to bear S.W.  $\frac{1}{4}$  W., and steer N.E.  $\frac{1}{4}$  E. which course will lead out through the Gull Stream, between the Brake and Goodwin ; when as far as the Gull light-vessel, keep N.E.  $\frac{1}{4}$  E.

Be careful to keep the lead going, and when so far to the northward as to bring the North Foreland light to bear N.W. by N., steer E.S.E. or E., which will carry you clear of the North Sand Head and light-vessel. There are not more than 6 or 7 fathoms on the flat off the Foreland ; but when the water deepens to 18 or 20 fathoms you will be outside of all the sands, and may steer either to the northward or southward, as occasion requires. Small vessels drawing less than 12 feet may proceed through the Inner Channel, as before directed.

The **SMALL DOWNS** is that space between the south end of the Brake and the shore, extending about 2 miles from Sandown Castle, towards Ramsgate, with good anchorage in from 6 to  $2\frac{1}{2}$  fathoms, with the coast-guard and No. 2 Battery, which stands about 2 miles to the northward of Sandown Castle, appearing between the two churches of Sandwich ; Deal Mill and Sandown Castle in one.

**RAMSGATE** is built on the declivity and summits of two hills. Its harbour is formed by two stone piers, projecting 1,310 feet into the sea, and enclosing an inner harbour or basin. There is also a dry dock and building yard, a patent slip 450 feet in length, 350 feet of which is available for the reception of two vessels at the same time, of from 300 to 500 tons burthen, and drawing in ballast from 12 to 14 feet water.

To the northward of the Small Downs, between the Brake and Ramsgate, is the Inner or Ramsgate Channel, for navigating which, and it being of importance that ships should not run for Ramsgate Harbour when it is low water, the following rules must be observed :—

*A red ball will be hoisted upon the cliff near Jacob's Ladder, in the day-time, when there are 10 feet water between the pier-heads ; and at night, a red light*

in the light-house upon the west pier will be lighted when there is the same water; and they will be continued until the water falls to 10 feet, when a green light will be substituted. A green light is also exhibited from a lamp at the west end of the Wellington Crescent, on the East Cliff, which kept in a line with the west pier light, will lead up in the best water from the Fairway or Rattler buoy. Also, a green light on the West Cliff, noticed in p. 16 as leading lights for Old Cudd's Channel.

On the east pier-head is a light-house, showing a flashing light, described in p. 12.

It is high water, full and change, in the harbour at 11h. 45m.; and at 9h. 20m. in the morning, the tide begins to set N.E., and continues 5 hours and 25 minutes. On the moon's quarter it is high water at about 4h. 20m. At about an hour after the 10-foot signal is made, there will be 16 feet with spring-tides between the pier-heads; 2h. after, or at high water, about 20 feet. With neap-tides, 1 hour after the 10-foot signal is made, there will be 12 feet; 2h. after, or at high water, 15 feet.

To sail in from off Sandown Castle, steer about midway between the shore and the Brake, about 2 miles, when you will be up to the South Fairway buoy, and will have the light-house on the west pier-head on with the Obelisk; keeping these in one, will lead up to the red-and-white chequered Fairway buoy. Pass close on the outside of this buoy, and steer directly for the west pier-head.

In approaching the harbour, if the tide sets to the eastward, keep good sail on the ship, and steer close to the west pier-head, and if you cannot conveniently make fast to one of the buoys within the harbour, throw all your sails aback, and let go your anchor; or if you have no anchors, run on the East Bank, directly towards the pier-house; you will then be under the direction of the harbour-master, who will order you into a proper berth.

N.B.—The best time to enter Ramsgate Harbour (if the vessel does not draw too much water) is 2 hours before high water, or when the tide begins to set to the N.E., outside the pier-heads.

A boat and men are appointed to attend ships coming into the harbour, without expense. They in general make a rope fast to bring you up, and then leave you if there are many ships coming in; but if not they will assist you further.

DIRECTIONS for SAILING towards the harbour in the NIGHT, which is only to be attempted by vessels of burthen in cases of extreme necessity:—

All captains of ships in the Downs, in bad weather, should know their exact situation before dark, by intersected bearings of Sandown Castle and the Halfway Houses; and, consequently, their bearings and distances from the point where the buoy of the South Fairway or Rattler is placed. They should also keep a good look-out for, and note the time when the 10-foot signal is made.

If vessels part from their anchors, or are obliged to cut from them they must steer by their bearings, obtained before night, such a course as will bring them to the buoy in the Fairway, when the western reflector of the light on the west pier-head will bear N.E. by N., and will be in line with the green light, on the East Cliff (the only guides in the night). Keeping the lights on these bearings, and in a line, will bring you to the west pier-head, when you must enter in the manner before directed.

N.B.—If the tide be running to the eastward, take particular care not to let the light get to the northward of N.E. by N., until you almost touch the pier-head, or the tide will certainly set you to the eastward, past the entrance. It is desirable that no vessel will cut or run for Ramsgate Harbour in the night-time, unless in case of real distress, lest by so doing she run into greater danger, with a view only to avoid a temporary gale, which perseverance and good ground tackle might have enabled her to ride out, at least until day-light. But the safest way is

the night-time is to run for the Gull Stream, by bringing the South Foreland high light to bear S.W.  $\frac{1}{4}$  W., until you come abreast of the Gull Stream light-vessel, keeping her on the starboard side; then steer N.E.  $\frac{1}{4}$  E. until the Goodwin light-vessel bears S.E., in 7 or 8 fathoms; you may then anchor or bring-to for the night.

There is an inner passage or channel to Ramsgate leading, to the northward of the Brake, named Old Cudd Channel, but fit only for small vessels, being much encumbered with shoals, the situations of which will be best understood by an inspection of the chart. Old Cudd Channel should not be attempted by any one not well acquainted.

The shoals which bound these channels are the Brake, Quern, and Dike.

OLD CUDD CHANNEL is narrow and situate between the Quern, and Dike, chiefly used when bound to Ramsgate from the northward. To sail through this passage, bring the Pugin Tower (to the westward of the town) just open to the west of the west pier which leads through. This will lead from the southward of the Gull Buoy, to the northward of the North Bar buoy, and the buoy of the North Brake, and between the Dike and Quern buoys. The width of the channel between the buoys is less than a cable's length, and the least depth 9 feet.

**Leading Lights.**—One green light will be shown upon the West Cliff, and a second green light in the light-house on the west pier, which two green lights will indicate that there is less than 10 feet at the entrance of the harbour, and when in a line will lead in the best water through Old Cudd Channel. When there are 10 feet and upwards at the entrance of the harbour, the green light on the west pier will not be shown, and the usual red light of the light-house will be shown, and this in line with the green light on the West Cliff will constitute the leading lights through the channel towards the harbour. The green light now shown at the west pier light-house, in the direction of Old Cudd Channel, when the tide has fallen to 10 feet, will be shown on the same arc as the red light.

Vessels drawing more than 9 feet should not attempt to enter the harbour until the red light is exhibited at the pier light-house.

Ships in the DOWNS, when bound to the westward with southerly winds, should weigh at slack water, and cast their heads towards the shore. In turning out of the Downs, great care must be taken to avoid those sands, which lie in the way. Stand no nearer to Deal Bank than 7 fathoms nor into less than 12 fathoms, off the pitch of the Foreland. Stand towards the Goodwin Sands into 12 fathoms, until Ringwood Church comes on with the old wall to the northward of Kingsdown; then tack when in 13 fathoms, as the Goodwin is steep-to from thence to the South Sand Head.

The marks to carry you clear of the South Sand Head are Upper Deal Mill over Walmer Castle, or Folkestone Church a little to the left of Shakespeare's Cliff. In the night keep the South Foreland lights in one, bearing W.  $\frac{3}{4}$  N. Between the South Sand Head and the South Foreland you will have from 10 to 13 fathoms. At the South Sand Head, Shakespeare's Cliff appears just as much to the left of the South Foreland as the higher light appears to the right of it; but the best guide is the light-vessel.

**TIDES.**—Upon the Varne and Ridge it is high water, on full and change, at 10h. 40m.; but the north-eastern stream does not commence until  $4\frac{1}{2}$  hours' flood by the shore, nor the western stream until  $4\frac{1}{2}$  hours' ebb. The tide runs  $6\frac{1}{2}$  hours to the N.E. and  $5\frac{1}{2}$  hours to the S.W.

On the south side of the channel it is high water at Calais at 11h. 49m., 5 minutes later than at Ramsgate. In the Gull Stream, near Bunt Head, the N.E. stream begins at about 1h. 10m. before high water at Dover, and runs 6 hours; it then turns and runs in a contrary direction, till  $1\frac{1}{2}$  hour before next high water.

At DEAL and in the Downs, the tide flows until 11h. 15m., on full and change, and spring-tides rise 18 feet, neaps 10 or 12. At the South Foreland it flows

until 11h. 5m. In the stream in the Downs the tide runs north-eastward about 4 hours after it is high water by the shore; the flood, or the north-eastern stream, runs about 6½ hours; and the ebb, or south-western stream, 5½ hours. When the wind is at N.E., and blows strong, it sometimes keeps back the tide in the Downs an hour or more; southerly winds have a contrary effect. When rounding the South Foreland, in light winds and flood-tide, endeavour to keep near the point, lest the tide should set you too near the South Sand Head.

**EASTWARD OF GOODWIN SANDS TO THE DOWNS.**—To sail to the northward of the North Sand Head, bring St. Peter's Church tower well open to the right of Broadstairs Mill; in the night, bring the North Foreland Light N.W. ½ N. and come no nearer than 8 fathoms; and should the North Sand Head Light-vessel be gone, keep the North Foreland Light in the above bearing until you get into 18 or 19 fathoms, and keep the lead going. From a depth of 18 fathoms a S.S.W. course for 5 miles, until past the Goodwin beacon; then W.S.W., 6 miles, will bring you to the southward of the South Sand Head, or, when you get the South Foreland lights W. by N., or in one, you may boldly steer in for the Foreland, into 13 or 12 fathoms; then steer N.N.E. ½ E., or N.E. by N., for the Downs.

In the day-time, Folkestone high land clear of Shakespere's Cliff, is the mark for sailing in clear of the South Sand Head. In proceeding from the North Foreland to the back of the Goodwin with a southerly wind, endeavour to be off the North Sand Head when the tide begins to run to the southward, and come no nearer to the east side of the Goodwin than 26 or 28 fathoms, until you are to the southward of the Goodwin beacon, and have the Gull Light N.W. ½ N., nor bring the Goodwin Lights to the eastward of north; but with the Gull Light N.W. by N. you may bring the Goodwin Lights, N.N.E., until you get the South Foreland Lights in one, W. ¾ N., which mark clears the South Sand Head. Keep the lead going.

The buoys and light-vessel on the east side of the Goodwin will be the best guide by day.

## STRAIT OF DOVER.

### Description of the Shoals, &c.

**THE VARNE and RIDGE.**—Nearly midway of the Strait of Dover are two shoals called the Varne and Ridge, the former lying on the English, the latter on the French side. The N.E. end of the Varne lies S. by W. ¾ W., 8 miles from the South Foreland high light; and N.W. by N., 8½ miles, from Folkestone Church. From this end the sand extends S.W. by W., 5 miles, and is about three-quarters of a mile broad. The S.W. end of the sand lies S.S.W. ¼ W., 11 miles, from Dover Castle; S. ½ E., 9½ miles, from Folkestone Church; and E.S.E. ½ E., 12 miles, from Dungeness light-house. On this end of the sand are 6 fathoms, on the E. end 4 fathoms, and on the other parts from 1½ to 4 fathoms. Near the sand on each side are 12 and 13 fathoms.; and between the coast and shoal are 14, 16, and 18 fathoms.

**THE Varne Light-vessel** is placed in 16 fathoms, about a mile W. by N. ½ N. from the S.W. end of the sand, and exhibits a quick, red, revolving light, has one mast, carries a ball at the mast-head, and lies with Dungeness light-house W. by N. ¼ N., 11½ miles; Folkestone Church N.-westerly 9 miles; South Foreland high light N.E. ¾ N., 12½ miles, and Cape Grisnez light S.E. ½ E., 12½ miles. S.E., three-quarters of a mile from the light-vessel is the Varne Watch buoy, painted black.

**Buoy.**—A large red spiral buoy, with staff and ball in 13 fathoms, off the N.E. [E. CHANNEL.]

end of the shoal, with Varne light-vessel S.W. by W.  $\frac{1}{4}$  W.; South Foreland high light N. by E.  $\frac{1}{4}$  E., 8 miles, and Folkestone Church N.W., 8 miles.

The N.E. end of the Ridge, in 6 fathoms, lies S. by W., 11 miles, from Dover Castle, and N.W.  $\frac{1}{4}$  N., 9 miles, from Cape Grisnez light-house; it thence extends S.W.  $\frac{1}{4}$  W., 9 miles, and is a mile broad. The S.W. end, in 6 fathoms, lies S.E.  $\frac{1}{4}$  S.,  $13\frac{1}{2}$  miles, from Dungeness light-house; S.S.W.  $\frac{1}{4}$  W., 19 miles from Dover Castle, and nearly W. by N.,  $11\frac{1}{2}$  miles, from Cape Grisnez. On the middle of the sand are  $2\frac{1}{2}$  fathoms, and on a spot near the W. end only a fathom, and close to both sides are 11 and 12 fathoms. The channel between the E. end of this sand and the Varne is about 2 miles wide, with 16 fathoms in the middle. The spring tide sets across the sand at the rate of  $2\frac{1}{2}$  miles per hour.

Deal mill kept open of the Hope land will carry you clear to the eastward of both banks; Montlambert telegraph, on with Boulogne New Cathedral, S.E., will take you to the southward of the Ridge. The light-house of Cape Grisnez, bearing E.  $\frac{1}{4}$  N., leads in mid-channel between the Ridge and the Ridens.

**Bullock Bank.**—This bank lies with Dungeness light-house bearing N.  $\frac{1}{4}$  E., 11 miles distant, and Cape Grisnez light-house E., 21 miles, with 9 fathoms upon a bottom of fine sand.

## THE COAST OF FRANCE FROM CAPE BLANCNEZ TO THE RIVER CANCHE.

### Description of the Land, &c.

CAPE BLANCNEZ, or Calais Cliff, lies 6 miles W. of Calais, and at nearly 6 miles W. by S. from the latter is Cape Grisnez. Blancnez, so called from its whiteness, may be distinguished 19 or 20 miles off. Between Blancnez and Grisnez the land is hilly, though the shore about Wissant, which is midway between, is sandy. A dry sand at low-water extends the whole way along shore from Calais to Cape Grisnez, drying, upon an average, one-third of a mile from the shore; upon this sand, to the N.E. and S.W. of Blancnez are some rocks. The water continues shoal to some distance from the dry sand, and on the parallel of the Bas Escalles, stretches out 2 miles from the coast, turning S.W. to Cape Grisnez, forming the Ligne Bank, some parts of which, in an E. by N. direction from Cape Grisnez, dry; but to the S. of which there is a very shallow channel. This bank is marked by a buoy, bearing N.E. by E. from Cape Grisnez light-house, distant nearly 4 miles, and 2 miles off the shore. The Rouge Riden and the Quenocs lie to the N. and N. by W. from Blancnez, the least water upon each being  $1\frac{1}{2}$  fathom; the outer one, the Quenocs, is about  $1\frac{1}{2}$  mile from Blancnez, and marked by a bell buoy. Upon the N.W. part of the Ligne Bank, called the Barriere, near where the buoy is placed, the depth is not more than  $4\frac{1}{2}$  feet; and to the eastward of which, near to the dry sand of the coast, are some rocks, which dry called the Guards.

Between Blancnez and Cape Grisnez, 16 fathoms is as near as a large vessel ought to stand inshore in thick weather, till you get Cape Grisnez to bear S., when you may haul in for it. Thence to Boulogne the coast is clear all the way, within half a mile of the shore.

**CAPE GRISNEZ.**—A light-house is erected upon Cape Grisnez, from which a bright revolving electric light is shown every half minute; it is elevated 79 feet from the base, and 226 feet above the sea at high water, and may be seen 24 miles off.



Between the Ridge and the shore are from 20 to 30 fathoms, the deepest water being near the Ridge. You may stand towards the shore into 11 fathoms without danger. Here, as at Dungeness, the North Sea and Channel tides meet.

From Cape Grisnez to the entrance of Boulogne, is S.S.W. nearly 9 miles. About  $1\frac{1}{2}$  mile to the southward of the cape in St. John's Road, is an anchorage of 9 to 10 fathoms, where ships lie secure from E.N.E., East, and S.E. winds; but with the wind strong from the S.W., West, or N.W. it is dangerous; and as the ground, for about half a mile from the shore, is foul and rocky, be careful not to come within that distance, nor into less than 9 or 10 fathoms. Between this road and a point to the westward of Boulogne are several sunken rocks, some of which lie nearly half a mile from shore.

About 4 miles to the S.S.W. of St. John's Road, and 2 miles S.W. by W.  $\frac{1}{2}$  W. from the entrance to Ambleteuse Harbour, is the road of Ambleteuse, where vessels may ride in 6 to 8 fathoms, during easterly gales. Within 2 miles to the northward of Boulogne are two towers or forts, built on the rocks, which dry at low water; and within the same distance southward is a similar one called Fort Heurt; these become isolated at high water.

**BOULOGNE HARBOUR** has of late years been considerably improved; new piers have been built, and the basin much extended. Vessels may anchor off the harbour, at a mile from shore, in 6 to 9 fathoms.

**Lights.**—Two tide-lights are exhibited on the head of the S.-western jetty; the one elevated 43, and other 33 feet above high water. They are placed vertically and are both fixed lights, visible 9 miles. When there are  $9\frac{1}{2}$  feet on the bar, the first lantern is lighted; and at high water a second lantern below the first. Both are extinguished when there are only  $9\frac{1}{2}$  feet at ebb on the bar. At the end of the N.-eastern jetty a fixed red light is placed, elevated 46 feet, visible 4 miles, and lighted from  $9\frac{1}{2}$  feet flood to  $9\frac{1}{2}$  feet ebb, so that from high water until  $9\frac{1}{2}$  feet on the falling tide all three lights are exhibited, after which they are extinguished. A fixed green light is also shown at the extremity of the N.E. jetty, and a ball by day; this green light in line with the red light indicates the direction of the stone foundation close to the N.E. jetty.

The general direction of the entrance is S.E. by S.; then S.E. into the harbour, and is bounded by two jetties; the one to the S.-westward is solid up to the level of high water; it stretches out to the length of 2,205 English feet; the other to the N.-eastward extends directly out, parallel with, but not so far out as the S.W., being 1,641 feet in length. The channel is 4 cables long and 200 feet wide. The N.E. jetty has been extended by the addition of a low breakwater, 500 yards long, composed of rough stone work for 150 yards from the jetty head, and with strong stake work the remaining length. This breakwater is from 3 to 9 feet above the level of low water, and its position is marked by two black buoys, one placed near the outer extremity, at  $1\frac{1}{2}$  cable's length from the outer end of the S.W. jetty, and the other about half a cable further in. Off the end of the N.E. pier a buoy is, or was, laid down to where it is rocky, and to where the N.E. pier may hereafter possibly be extended.

**TIDES.**—It is high water, on full and change, at 11h. 25m. A.M. Highest spring-tides rise 25, neaps  $19\frac{1}{2}$  feet.

The great object of the improvements has been to make Boulogne a harbour of refuge for ships surprised by bad weather in the Channel; and it may be useful to add, that in the construction of the jetties everything has been done to facilitate the movements of vessels; and that the system of signals, both for day and night, has been made as perfect as possible. The entrance is so easy, that mariners who have been once in take no pilots, even at night. This harbour may, therefore, now be considered, if taken at proper time of tide, as one of the easiest and safest in this part of the English Channel.

*The channel between the piers dries about 2 to 3 feet above low water low*

spring-tides; and the sand, over which vessels pass to enter the port, dries to about the same height, a quarter of a mile to the W. of the end of the S.W. pier. Within the harbour the bottom is dry at low water.

The coast from Cape Grisnez to the southward of Boulogne is protected by batteries; and a lofty column is erected near Boulogne, called the Column of Napoleon; it is 160 feet high.

## BANKS OFF THE LAND.

**BASSURE de BAAS.**—Outside the harbour lies the Long Bank, called the Bassure de Baas, which stretches lengthwise, in a curve, from Ambleteuse to the S.W. by S., W.S.W., and W., for 11 leagues. This bank is divided into two parts by a swatchway, of  $7\frac{1}{2}$  fathoms, at 6 miles from the N.E. end. The bank is half a mile broad, and has upon it generally from  $3\frac{1}{2}$  to 7 fathoms. Its shoalest part has about 12 feet upon it, and lies with Cape D'Alpreck light-house E. by N.  $\frac{1}{4}$  N., a little more than 2 miles distant, and the Napoleon Column in line with Heurt Fort, bearing E.N.E. During westerly gales the sea breaks with great violence on this part. The eastern part of the bank is steep-to; but you may pass through the channel between the 12 feet shoal and the shore by keeping Crèche Point, just touching Heurt Fort. To the northward of the swatchway the depth is 6 fathoms, then decreasing to 3 and  $3\frac{1}{2}$ . To the southward of the shoalest part the depths are  $3\frac{1}{2}$  and 4 fathoms, to  $3\frac{1}{2}$  on the parallel of  $50^{\circ} 30'$ , then increasing to 5, 6, 7, and 8 fathoms, and at the S.W. end are 11 and 9 fathoms. Close to the western side of the bank are from 11 to 14 fathoms. With the pier-head of Boulogne S.E., you cross the bank in about 6 fathoms. A large ship may cross it in 7 to 8 fathoms by keeping the Napoleon Column in one with the tower on the S.W. jetty, E.  $\frac{1}{4}$  N.

**VERGOYER.**—About 4 leagues W. by S. from the entrance of Boulogne lies a sand-bank, called the Vergoyer, on the shoalest part of which there are but 12 feet at low water. From this part Cape Grisnez bears N.E.  $\frac{3}{4}$  E., distant 19 miles, and Dungeness N. by W., 24 miles, and Mont St. Frioux E.S.E.  $\frac{1}{4}$  E.,  $11\frac{1}{2}$  miles; and from this part of the bank the French coast can be plainly seen. The bank is dangerous to vessels coming from the northward, when the sea does not break on it. It extends W.S.W.  $\frac{3}{4}$  S., nearly 13 miles, and has from 2 to 8 fathoms on it. Near the N. side are from 20 to 25 fathoms; and between it and the Bassure de Baas, from 13 to 17 fathoms.

**BASSURELLE.**—N.W. by W., distant 8 miles from the shoal part of the Vergoyer, lies another shallow bank, about 2 miles in length, N.E. and S.W., called the Bassurelle; this has from 4 to 7 fathoms on it, and bears from Cape Grisnez W. by S.  $\frac{3}{4}$  S., distant 23 miles, and from Dungeness S.  $\frac{1}{4}$  W., 18 miles. There are from 9 to 15 fathoms close to it, and between it and the Vergoyer from 19 to 32 fathoms. This bank should be carefully avoided by large vessels, or even small ones in bad weather.

**LES RIDENS.**—Just to the northward of a direct line between Bassurelle and Cape Grisnez, and at the distance of 13 miles from the latter, lies some shoal patches of sand, called by the French the Ridens, the shoalest of which has 6 fathoms upon it. These patches seem to be what was formerly the Boulogne Middle. They lie S. by W.  $\frac{1}{4}$  W., distant 5 miles from the S.W. end of the Ridge, and S.S.E.  $\frac{1}{4}$  E., 17 miles from Dungeness. Between these banks and the Ridge there are 11 and 14 fathoms; close to their E. side there are 14 fathoms, and between them and the shore, 17 to 30 fathoms; between them and the Vergoyer, 15 to 30 fathoms; and between them and the Bassurelle, from 15 to 20 fathoms. On the western side there are only from 9 to 11 fathoms, to the distance of  $1\frac{1}{2}$  mile, in a W.N.W. direction.

All the banks in the environs of Boulogne are formed of fine sand and mussel shell.

**POINT D'ALPRECK Light.**—On this point, which is little more than 2 miles to the S.W. of Boulogne, a light-house is erected, about 33 feet high; the height of the lantern above the level at high water is about 161 feet. It is situate near the Old Semaphore,  $2\frac{1}{4}$  miles S.W. of Boulogne, and exhibits a fixed light, varied by a red flash every two minutes, visible at the distance of 10 miles in clear weather. Each flash is preceded and followed by a short eclipse. The cape upon which the light-house stands is a perpendicular rocky cliff 135 feet above the level of high water. A rocky shelf covered with boulders, dries about a cable's length from the foot of the cliff at low tide.

**ETAPLES.**—From Boulogne to the River Canche, or harbour of Etaples, the distance is 4 leagues. The land between is high, and has a white appearance, but the coast is bordered with sand-hills and downs. On this high land is situate the Mont St. Frioux already noticed. The harbour is dry at low water, and has several shifting banks at its entrance.

**Lights.**—1. On Point L'Ornel, N. side of the mouth of La Canche River is a circular stone tower, 40 feet above the level of high water, exhibiting a fixed light visible 6 miles.

2, 3. On Point Touquet, S. side of the entrance of the river, two octagonal light-houses are erected, each 167 feet in height, and 174 feet above the level of high water. They are situate N.N.E. and S.S.W. of each other, distant 273 yards, and exhibit fixed lights, visible at the distance of 20 miles.

## FROM THE DOWNS TO BEACHY HEAD.

**DOVER.**—The harbour of Dover is situate 3 miles W.  $\frac{3}{4}$  S. from the South Foreland headland and is 21 miles distant from Cape Grisnez, on the coast of France. This town forms a point of communication between England and the Continent, and has regular intercourse with Boulogne and Calais. To the east of the town is the ancient castle on the top of a commanding hill. It has also a citadel and several strong detached forts.

The entrance to the harbour is between two piers, and is 150 feet wide, in the direction of N.W. by N. and S.W. by S., there being little over 3 feet of water between them at low water. The western pier projects further into the sea than the other, and has a flagstaff upon it, from which two of the tide lights are exhibited.

**Admiralty Pier.**—This pier is built out from Cheeseman's Head, in a S. by E.  $\frac{1}{4}$  E. direction, about 2 cables' length, then turning to the S.E.  $\frac{1}{4}$  S. for nearly  $1\frac{1}{2}$  cable. At the end of this pier a light is shown from a tower. The light is a fixed white light varied by flashes at intervals of seven seconds and a half; it is 44 feet above high water, and in clear weather the fixed light should be visible from a distance of 6 to 7 miles—the flashes somewhat farther.

The tower, 30 feet high, is cylindrical and painted red. A bell will be sounded in foggy weather, giving single strokes at intervals of seven seconds and a half. The blue light previously shown from the end of the Admiralty pier is discontinued. This pier renders the harbour always open to vessels, when there is sufficient water at the entrance.

The harbour consists of three basins, the outer one being the tidal harbour; then an inner harbour enclosed by flood gates; and a pent-up basin communicating both with the inner and outer harbours, as required. At the N.E. end of this basin is a patent slip for hauling up vessels for repairs, &c. The London

Chatham, and Dover Railway runs through the town and on to the Admiralty Pier, and the South Eastern comes along the coast and through a tunnel under Shakespeare's Cliff to the S.W. of the town.

**The Harbour Lights and Tide Signals.**—1. The first is the light above mentioned at the end of the Admiralty Pier.

2. There are three fixed lights exhibited on the south pier-head.

3. A red light is shown from the north pier-head, 12 feet in height, and visible 3 miles. These lights on the north and south piers are tidal lights.

4. A green fixed light exhibited at the west side of entrance to Granville Dock, about 9 feet from the edge of the wharf near the gates.

**NOTE.**—The two red tidal lights, of unequal heights, are exhibited from a staff on Dover south pier-head, and the small low red light on the north pier-head. This latter red light, and a similar red light on the low outer corner of the south pier are shown when there are from 7 to 10 feet water at the entrance; the two red lights on the staff on the south pier, and the low red light on the north pier when above 10 feet, and till the water has fallen again to that level, and the single low red lights on each pier when there are from 10 to 7 feet. The lights only point out the position of the piers, and do not indicate the channel, which continually varies with the shifting of the sands.

**Day Signals.**—When the depth of water on ebb and flow, by the index is from 7 to 10 feet, a red flag, with a black ball under, is shown from the customary staff on the south pier. From 10 to 13 feet, a red flag only on the same staff. From 13 feet upwards, a red flag with a black ball over on the like staff.

No signals to ships in general will be made between 7 feet ebb, and 7 feet at flood, and whenever, at other times, the harbour is inaccessible to vessels, the flag (if in the day) will be hauled down, and (if at night) the light or lights on the south-pier will be extinguished.

**TIDES.**—In the harbour of Dover it is high water at 11h. 12m.; the water rises at spring-tides nearly 19 feet, neaps 15 feet; and on the bar, at half-flood, 10 feet.

**ANCHORAGE.**—Vessels using the anchorage in Dover Bay during westerly winds, should avoid anchoring with the end of the Admiralty Pier on a S.W. by W. bearing; for on this line, between the tidal periods of 5 hours' flood and half-ebb, the eastern stream carrying the westerly swell with it up channel, and running close past the end of the pier with great velocity, is there met by the eddy or outflow from Dover Bay, which, opposing the progress of the advancing swell, throws up a short turbulent sea along the line of contact in a N.E. by E. direction from the pier end, causing vessels to roll and surge about, risking fouling their anchors and snapping their chains.

Large vessels should therefore anchor outside this line, in not less than  $5\frac{1}{2}$  to 6 fathoms at low water, with the keep of Dover Castle within or westward of the Castle jetty, one-third the distance towards the Boundary Groyne, bearing N.  $\frac{1}{4}$  W.; and the end of the Admiralty Pier W. or W. by S.; Shakespeare's Cliff will then be nearly in a line with the end of the Admiralty Pier.

Small vessels should anchor with the entrance of Dover Harbour open, and not further out than to have the end of the Admiralty Pier bearing S.W. by S.

In coming from the westward for Dover Harbour give the end of the Admiralty Pier a good berth, then steer towards the pier heads; but it is not advisable to enter directly after a gale of southerly or S.-westerly winds without a pilot. The best time to enter is about 1 $\frac{1}{4}$ h. before, and 1 $\frac{1}{4}$ h. after H.W.

In order to warn vessels of the dangers near Folkestone, the South Foreland high light is not visible to the northward of the line of bearing E. by N. Off *Folkestone*, stand off shore when the high light disappears; but vessels drawing more than 14 feet should stand off shore when the low light disappears.

**FOLKESTONE** lies 5 miles W.  $\frac{1}{4}$  S. of Dover, and has a small harbour, much frequented by steam-packets, which run between Folkestone and Boulogne.

**Harbour Lights.**—On the S. pier-head a red light, 37 feet above high water. A white light under the red (see day and night signals). Vessels drawing 14 feet can enter at high water springs; the entrance is nearly dry at low water spring-tides.

An iron skeleton light-house on the extremity of the New Pier, S.  $\frac{1}{4}$  W. westerly, 224 yards from light-house on south pier. This light-house shows a green light, seen in all directions seaward, from W. by N. to E.N.E. A white light inshore of the above bearing indicates danger.

**Day Signals.**—A red flag is hoisted half-mast at the harbour flag-staff, when the depth of water at the entrance of the harbour is 12 feet.

The red flag is hoisted at the mast-head, while the depth of water is 14 feet.

When the depth of water is above 14 feet, a black ball is shown under the red flag.

When the flag is hauled down to the base of flag staff, it indicates that caution is necessary.

When the red flag is not shown, there is less than 12 feet water, or some obstruction in the fairway; or the harbour is inaccessible.

**Night Signals.**—A fixed red light is exhibited from the Harbour South Pier light-house, while there is 12 feet water between the pier-heads.

A white light is shown under the red light from the same light-house, while the depth of water is 14 feet between the pier heads.

When the red light is blinked at intervals, it indicates that caution is necessary.

When the lights are not exhibited, there is less than 12 feet water, or some obstruction in the fair way; or the harbour is inaccessible.

Mariners are cautioned against entering the harbour when the red flag is not shown or when the red light is not exhibited. Vessels entering under such circumstances are liable to a penalty.

**ANCHORAGE.**—Off Folkestone there is anchorage in 12 or 14 fathoms; but near this place, and to the westward of it, a ledge of rocks runs off a quarter of a mile from the shore, having 12 fathoms close to it, which may be avoided by keeping the South Foreland open of Dover Cliff. The green light on the new pier leads about 70 yards clear of the Mole Head and Oak-End Rocks off Folkestone. North, or inshore of the above lines, the light changes to white.

It is high water at Folkestone Pier at 11h. 7m.; spring-tides rise 20 feet, neaps 16 $\frac{1}{2}$  feet.

**EAST ROAD.**—To the S.-westward of Folkestone is a flat, running in the direction of the coast towards Dungeness, and having over it 2 and 4 fathoms; this part is now called the East Road. On this flat is situated what is called the Roar Bank, about a mile from the shore, with 1 $\frac{1}{2}$  fathom on it; it extends N.E. and S.W., the centre part lying with Romney Church W.N.W. To the S.S.W. of this bank the flat extends off and forms the Swallow Bank, with 3 fathoms on it; Dungeness light-house bearing S.W. by W.  $\frac{1}{2}$  W. will lead clear of the flat and the Roar, and leads up to where a black-and-white chequered buoy is laid, called the Newcome Buoy, with Lydd Mill N.W.; Dungeness light-house S.W.  $\frac{3}{4}$  W.; and Romney Church N.  $\frac{1}{2}$  W.; midway between this buoy and the shore are less than 6 feet at low water.

To the eastward of Dungeness is the cruising ground for the Cinque-port pilots.

**DUNGENESS Lights.**—Dungeness is a low, steep, beachy point, with a round light-house upon it, bearing a fixed light of the first order, which may be seen 15

miles off. The body of this light-house is painted in red and white horizontal bands to distinguish it as a sea mark by day. It lies nearly 21 miles W.S.W.  $\frac{1}{4}$  W. from the South Foreland; and the point of the Ness may be rounded in 12 to 9 fathoms if necessary; at  $1\frac{1}{2}$  cable's length from the Ness are 15 fathoms, in which depth the greatest strength of the tide is found. High water at 10h. 45m., spring-tides rise  $21\frac{1}{2}$  feet, neaps 19.

The high light of Dungeness has been altered from an electric light to the most powerful form of oil light, and the red light to the westward is shown from the lantern instead of, as formerly, from a window beneath it. There is, consequently, no white light in a westerly direction between the bearing of west from the light-house and the land.

The limit of the red sector of light of Dungeness light, seen from East Bay, is visible from the bearing of S.W. by W.  $\frac{1}{4}$  W. in to the land.

**Dungeness Beacon.**—In consequence of the rapid accumulation of the beach to seaward at Dungeness Point, a conspicuous beacon of wood, consisting of a mast, 50 feet high, with two large globes fixed vertically thereon has been placed on the point, a few yards above high water mark, about 400 yards S.E.  $\frac{1}{4}$  E. from the light-house tower.

**Dungeness Outer Light.**—In consequence of the beach at Dungeness having grown out, so that the light-house is now some distance inland, the extreme edge of the shore is marked by an additional light-house placed to the S.E. of the inner light-house, as near the high water line as practicable.

The light is a flashing white light, showing a quick flash at intervals of five seconds, the flash being of two seconds duration; it is elevated 28 feet above the level of high water, and visible over the same arc as that covered by the high light.

The building from which the light is exhibited is situated S.S.E.  $\frac{1}{4}$  E., 225 yards from Dungeness high light tower. The fog signal is placed in this building, and gives during fogs two blasts every two minutes.

**RYE HARBOUR.**—The entrance to this harbour lies about N.W.  $\frac{1}{4}$  W., 8 miles from Dungeness. In ancient times this town stood by the seaside, and built on a rock on the edge of an extensive marsh; but is at present about 2 miles from the sea, and there are many remains of its former importance, among which are its walls and gates. The present harbour is formed by a canal, admitting vessels of 200 tons. The channel beyond the outer green and red lights is pointed out by buoys.

A groyne has been erected at the western entrance of the harbour. It extends 300 yards in a S. by E. direction, and is covered with water when there are 13 feet shown at the gauge-board. A beacon is placed on the outer end 30 feet high, which has a black ball on the top, to be left on the port side in entering.

**Lights.**—At Rye there are five lights to assist in taking the harbour in the night-time.

1, 2.—Near Camber, at the north side of entrance, are two white light-houses, 24 and 18 feet in height, and 47 and 24 feet above the sea. They both exhibit fixed white lights while there are 10 feet water on the bar, and are visible 5 miles each. They are situate N.  $\frac{1}{4}$  W. and S.  $\frac{1}{4}$  E., 180 yards apart.

3, 4.—Two fixed red lights on the E. side of entrance, one at 36 fathoms from old pier head, erected on a mast, 28 feet in height, and 36 feet above high water. This serves as a tide light, and is visible 2 to 3 miles; and one on the Dolphin to show the eastern pier head, on a white mast, 19 feet above high water, and visible 2 miles.

5.—On the extremity of the groyne, at W. side of entrance to harbour, a green fixed light, on a black mast 30 feet in height, and 10 feet above high water, exhibited from half-flood to about half-ebb, and visible 2 to 3 miles.

*NOTE*—The two white tide lights near Camber in one N.  $\frac{1}{4}$  W. lead between the

green light on the W. pier and red light on the E. pier. The green light is 87 yards distant from the red light on the E. pier.

**Tide Signals, by day.**—The following tidal signals are made from a telegraph flag-staff and yard-arm, fitted with 2 shutters, thus—for 8 feet, one shutter to be canted; for 9 feet both shutters; for 10 feet, a red ball at the mast-head; for 11 feet, the red ball with 1 shutter; for 12 feet, the red ball with both shutters; for 13 feet, the red ball, both shutters, and 1 black ball on yard-arm; for 14 feet, the red ball and 2 black balls; for 15 feet, the red ball and 3 black balls; for 16 feet, the red ball and 4 black balls; for H.W., a blue pendant under the red ball on the mast-head.

This harbour is chiefly used by coasters and fishing vessels, and to those seeking shelter or wind-bound it is difficult of access, and the services of a pilot are almost indispensable. There is a steam-tug in readiness for towing, which will attend at the usual signal.

**Buoys.**—The entrance of the channel is marked by a nun-buoy, somewhat within low water mark, on the starboard side, also a red one on the same side half a mile further in, and several others on the port side of the channel.

High water at 11h. 20m.; springs rise 22 feet; neaps, 16 to 17 feet at the pier-heads. The harbour dries at low water.

At 6 miles to the westward of the entrance to the old harbour at Rye, and 12 miles, W.  $\frac{3}{4}$  N. from Dungeness, is the Haddock Cliff and high land of Fairlight. At  $2\frac{1}{2}$  mile further is the town of Hastings, before which in the open road, vessels may anchor in from 2 to 5 fathoms; the latter depth being about a mile from the shore.

**HASTINGS.**—This town is between Fairlight and Bexhill, near to the beach; it is pleasantly situate, has a fine beach, and together with St. Leonards to the westward, has become a fashionable watering-place. The old town lies mostly in a hollow, nearly surrounded by hills. A number of fishing-boats belong to this town.

**Lights.**—For the use of the fishermen, and chiefly to direct them to the shore, two lights are exhibited all night throughout the year. The upper light is erected on the side of the W. hill above the town, and is an octagonal building 20 feet in height, and 180 feet above the sea, It is a fixed white light, visible 12 miles. The lower light is red, and shown from a white building on the beach, 25 feet in height and 30 feet above high water, visible only 5 miles. These lights bear N.N.E. and S.S.W., 300 yards apart.

**BEACHY HEAD.**—About 6 leagues W.  $\frac{3}{4}$  S. from the Point of Fairlight, and 10 leagues nearly W. from Dungeness is Beachy Head, a high and steep white chalk cliff, rising 530 feet, with a light-house upon it; to the westward of which are the Seven Cliffs, altogether forming the most remarkable land on this coast.

Eastbourne lies N.-eastward,  $2\frac{1}{2}$  miles from Beachy Head; to the S.-eastward ships may anchor, to stop a tide, in 7 or 8 fathoms. Hereabout the bottom is rocky a full mile from the shore, but further off there is a fine, clean, sandy ground.

At Eastbourne an iron pier is erected, at the end of which is a small fixed green light, visible 2 miles.

## FROM DUNGENESS TO BEACHY HEAD.

### Description of the Shoals, &c.

**DUNGENESS SHOAL.**—To the westward of Dungeness, is Dungeness or Stephenson Shoal, with 21 feet upon its middle, 4 fathoms on its E. and W. ends, and 5 to 6 fathoms round it; between it and the shore are from 7 to 2 fathoms. There is good anchorage within it, on fine soft ground. It extends nearly 2 miles W.  $\frac{1}{4}$  S., and is from half to three-quarters of a mile broad, its broadest part being to the westward. When the tower of Lydd Church and Post Mill are in one, bearing N.E., you will be to the westward of the sand; Dungeness light-house  
[E. CHANNEL.]

E.N.E., clears it to the S.-eastward, and Fairlight Church, W.N.W., clears it to the southward.

From hence, towards Rye and Winchelsea, the land bends in to the northward, and forms Rye Bay; that part just to the northward of Stephenson Shoal is called West Road.

THE BOULDER BANK now appears to join the extensive flat which runs off Rye Harbour to the S.W., nearly 5 miles to abreast Fairlight, having from 1 to 3 fathoms on it; its W. end, in  $3\frac{1}{2}$  fathoms, lies with Hastings, bearing N.W., distant 3 miles.; from hence a four fathom ridge extends S.W. by W.  $\frac{1}{2}$  W., 3 miles further; there are 5 to 6 fathoms between the ridge and Hastings. There is a knoll of only  $3\frac{1}{2}$  fathoms, lying  $3\frac{1}{2}$  miles from the land, with the middle of Hastings bearing N.

From Hastings the shore runs westerly to Pevensey, and then turns to the southward to Beachy Head, being a shingly beach throughout, with a few ledges of rocks attached to some part of the coast. Off Hastings are the Castle Rocks, and 3 miles further westward are the Bexhill Reefs, and nearly the same distance westward are the Couden Ledge and Coxheath Shoal of  $2\frac{1}{2}$  fathoms,  $1\frac{1}{4}$  mile off the land; Pevensey Bay is shallow, full  $1\frac{1}{4}$  mile from the land, and there are several rocky patches lying further out, some of which are very dangerous.

ROYAL SOVEREIGN SHOALS consist of several irregular patches of rocky ground extending in a N.W. by W. direction about 3 miles, and about 2 miles broad towards the eastern part; the general depth on these patches is from 3 to 4 fathoms, with 6 to 8 fathoms between them.

**Light-Vessel.**—A light-vessel is placed to mark the Royal Sovereign Shoals.

The light is a revolving white light, giving three flashes in quick succession which re-appear once in every minute; the time occupied by the exhibition of these flashes is about 23 seconds, and the main interval of obscurity 37 seconds; it is elevated 36 feet above the level of the sea.

The vessel is moored in 12 fathoms at low water springs, three-quarters of a mile to the southward of the 4 fathom patch, called the Southern Head, with the following marks and bearings:—

The light-house cliff just open of Beachy Head, N.W. by W.  $\frac{1}{2}$  W.; Langley Point Fort, N.N.W.  $\frac{1}{2}$  W.  $6\frac{1}{4}$  miles; Royal Sovereign buoy, north, westerly 2 miles; Dungeness Point E. by N.  $23\frac{1}{4}$  miles.

These bearings place the light-vessel in lat.  $50^{\circ} 42' 50''$  N., long.  $0^{\circ} 26' 45''$  E.

The vessel will be distinguished in the day-time by a small ball over the usual one at her mast-head. Royal Sovereign is painted on her sides.

**Buoy.**—Near the eastern part of these patches is a shoal of only 9 feet, and half-a-cable's length to the southward of this shoal is a conical buoy, striped vertically black-and-white, with staff and cage, and marked "Ryl. Sovn." It lies in 6 fathoms with Beachy Head bearing W. by N.  $\frac{1}{2}$  N.; the white mill N. of Bexhill N.E. by N.; the first Martello tower to the eastward of Eastbourne, on with the W. side of Willingdon chalk pit, N.W.  $\frac{1}{4}$  N., and  $8\frac{1}{2}$  miles from the light-house on Beachy Head.

The names given to the eastern group of these patches are the Eastern Shoal, Spit Shoal, Middle Southern Shoal, Inner South Shoal, and Kinsman's Nab; these lie within a space of  $1\frac{1}{2}$  mile each way, and enclose the 9 feet shoal. The Horse of Willingdon lies about three-quarters of a mile to the N.W. of the former group, and is three-quarters of a mile long, and 2 cables' length broad, with only 3 fathoms near its centre, which lies with Beachy Head signal-house bearing W. by N.; Beachy Head light-house W. by N.; and Pevensey Church, N. With the point of Beachy Head between the bearings of W.  $\frac{1}{2}$  N., and the light-house opening N.W.  $\frac{3}{4}$  W., you will be in a line with these shoals. The tides rise here in ordinary springs, about 20 feet; neaps 14 to 15 feet. Large ships should shape a course to pass to the southward of these patches. By keeping Beachy Head light N.W.  $\frac{3}{4}$  W., you will pass southward of all the shoals and light-vessel; and with the two white mills at Battle N.N.E., you will be to the eastward of them.

There is an outer shoal, called the Horse, or Southern Head, which is about a cable's length across, with 4 to 5 fathoms over it, and lies about a mile to the



southward of the Royal Sovereign Shoals, bearing from the signal-house at Beachy Head S.E. by E.  $\frac{1}{2}$  E. nearly, distant 7 miles; and from Pevensy Church S. by E. Near its southern edge are 6, 7, and 9 fathoms, and between it and the former shoals from 6 to 9 fathoms, except one patch of 5 fathoms.

A small bank lies off Langley Point, at a distance of half a mile, over which are only  $2\frac{1}{2}$  fathoms, Pevensy town bearing N. by E., and Beachy Head W. by S.  $\frac{1}{2}$  S. There is also a long narrow bank, beginning abreast of Rocky Foot Point, and running along one-eighth of a mile from the shore above 2 miles, over which are only 6 feet. Its N. end lies with Eastbourne Church N.W. by N., and its S. end with Beachy Head Signal-house N.N.W.  $\frac{1}{4}$  W. Within this, which is called Holywell Ledge, the ground is rocky and foul; but on the other side are 3, 5, 7, 9, 11, and 14 fathoms, deepening further out to seaward. At half a mile from the N. end of Holywell Ledge is what is called Eastbourne Road, where vessels may anchor with westerly winds, and be sheltered by the high land of Beachy Head. Do not go too near the shore, for there it is rocky, nor to the northward, of the town, for there the ground is foul; but when to the southward of the town, and above a mile from the shore, you will have a fine, clear, Sandy Bottom with 4, 5, 6, and 7 fathoms.

**DIRECTIONS.**—The course from the Downs outward, past the S. Foreland, is S.W. by S. about 2 leagues, with from 9 to 15 fathoms, and from thence to Dungeness W.S.W. nearly 7 leagues, observing to allow for the tide, &c.; in this track are 12, 14, 20, 17, 18, 14, and 17 fathoms. Beachy Head bears from Dungeness W.-southerly, nearly 10 leagues distant; but the course, from  $1\frac{1}{2}$  mile S. of Dungeness to 2 miles S. of the Outer Horse, or Southern Head, is W. by S. 8 leagues.

Turning to windward between the Varne and the shore, you may, while to the E. of Folkestone, stand in to 11 or 10 fathoms, and off to 16 fathoms, or until Dungeness light bears W.  $\frac{1}{4}$  S.; but when Folkestone Church bears N.  $\frac{1}{4}$  E., you will be to the westward of the Varne, and may bring Dungeness light-house to bear N.W. by W. Between Folkestone and Hythe, approach no nearer the shore than 14 fathoms, on account of the rocks before mentioned. Between Hythe and Dungeness you may stand in to 11 fathoms, and off to 18 or 19 fathoms. S. Foreland Light, as before observed, is now masked to the northward of the line of an E. by N. bearing, to warn vessels of their approach towards the rocks off Folkestone.

You may round Dungeness in from 12 to 9 fathoms if necessary. The strongest tide runs in 15 fathoms. Ships bound down Channel, and meeting here with westerly winds, may anchor to the eastward of the Ness, in 10 or 12 fathoms, the Ness bearing S.W. by W. or W.S.W., observing to keep the Hope Land, which is to the eastward of Dover, open; you may also anchor to the westward of the Ness, with N.E. winds, in 5 or 6 fathoms, the Ness bearing E.  $\frac{1}{4}$  S. with Lydd and Romney Churches in one, N.E.  $\frac{3}{4}$  E. Small vessels may anchor further in, in 5 or 6 fathoms.

In working down Channel, with a ship of great draught of water, when to the westward of Dungeness be careful how you stand in, until you get to the westward of Fairlight, for the shore, till then is not only flat a long way off, but there are also several sand-banks, with only 12 to 16 feet on them; stand towards Stephenson Shoal no nearer than the depth of 13 fathoms, or until Dungeness Light bears E.N.E., but when to the westward of Stevenson Shoal small vessels may venture nearer the land, into 6 or 5 fathoms, as the soundings decrease gradually. When Fairlight Church bears N. you may stand to the northward into 7 fathoms.

**TIDES.**—The stream between Beachy and Fairlight continues eastward until 12 o'clock, and to the westward of Dungeness till half-past one, while 3 leagues from the shore off Dungeness, and from the S. Foreland, it runs to the eastward until three-quarters past 2h., and towards the opposite coast until 3h.

In the Strait of Dover the stream runs eastward  $6\frac{1}{2}$  hours, and westward  $5\frac{1}{2}$  hours, occasioned by the meeting of the tides.

Off Dungeness, or rather to the westward of it, the North Sea and Channel tides meet. The flood tides run about 3 hours longer in the Strait of Dover than they do either to the westward or to the eastward of that strait, which must be owing

to the obstruction they meet with from the narrowness of the channel through which they pass.

When the flood to the eastward of the strait has flowed about 3 hours, the water, being then above the level of that in the strait, begins to run in, and continues to set to the westward for about  $5\frac{1}{2}$  hours; it then turns and runs to the eastward for about  $6\frac{1}{2}$  hours. Four hours before the flood has done running at Dungeness, the ebb-tide to the westward of the strait begins to run down Channel, so that the flood off Dungeness may be said to join the Channel ebb in the last 4 hours, for, during that time, they both run to the westward. At that period the ebb to the eastward of the strait has run for the space of 3 hours, and the water fallen below the level of that at Dungeness, which causes the ebb at the latter place to begin its course through the strait to the eastward. When the ebb at Dungeness has run 2 hours to the eastward, it is followed, or rather joined, by the Channel flood to the westward, and they continue to run through the strait together for about  $4\frac{1}{2}$  hours longer. If a ship carries the eastern stream as far as Fairlight, with a fair breeze she may continue it to the Downs. About Dungeness, where the tides meet, the water rises about 5 feet higher than it does either to the eastward or the westward of that place; on spring-tides it rises about 22 feet.

### FROM BEACHY HEAD TO SPITHEAD.

**BEACHY HEAD** (as observed, p. 25) is a very remarkable headland, being a high bluff chalk cliff, and may always be known by the seven white cliffs to the westward of it; it is situated about 10 leagues W. from Dungeness.

**Light-house.**—Upon Belle Tout (being the summit of the second cliff to the westward of Beachy Head) is a light-house of the first class, which exhibits a powerful bright revolving light every 2 minutes; duration of flash 15 seconds bright; and 1 minute, 45 seconds dark, and may be seen, in clear weather, a distance of 23 miles. Vessels sailing from the eastward will open the light when bearing N.W.  $\frac{3}{4}$  W., and by keeping it so will lead  $1\frac{1}{4}$  mile to the S.-westward of the Royal Sovereign Shoals light-vessel; and either going down or coming up Channel this bearing of the light will always warn you of the shoals when within 3 leagues of the light.

**SEAFORD HEAD.**—Four miles N.W. of Beachy Head light-house is Seaford Head 290 feet high, having somewhat the appearance of the former to vessels beating up channel, but may be known when within 4 or 5 miles by a green mark on the front of it, and by a Martello tower half a mile to the N.W.; part of this cliff has been blown up to prevent the encroachment of the sea at Seaford. Between Seaford Head and Beachy Head the shore is steep, and the soundings along it are regular.

Off the N.W. end of Seaford Head are the Henston Rocks, with 2 to 3 feet upon them; keep half a mile from the head and you will clear them.

In Seaford Road is excellent anchorage in 5 to 7 fathoms, good holding ground, with Seaford Church to the westward of the mill bearing E. by N., and Beachy Head light-house just shut in by the cliffs of Seaford Head. In this position the headland of Beachy Head affords shelter as far southerly as E.S.E., and is preferable to the W. Road of Dungeness. Further out, in 10 fathoms, the centre of the western cliff of the seven, comes open of Seaford Head. This is certainly a good place during N.E. winds.

**NEWHAVEN HARBOUR** lies N.W., distant 8 miles from Beachy Head, and E.  $\frac{1}{4}$  S., 29 miles from the Owers light-vessel. This harbour forms a good haven for ships of a certain tonnage, having within its piers, with spring-tides, 22 feet water, and with neap-tides, nearly 17 feet, and a depth of 6 or 7 feet at low water. On each of the piers there is a strong capstan, and a red buoy is moored outside the bar just to the E. of the entrance. There is good anchorage outside of the piers. *The principal imports* are coal and timber, and exports agricultural produce, corn,

&c.; and is also the port of steam communication between England and the port of Dieppe, in France.

**Lights.**—Two fixed lights, from wooden structures, on the W. pier, N.  $\frac{1}{2}$  W., and S.  $\frac{1}{2}$  E., 50 yards apart, elevated 30 and 17 feet respectively above high water, visible 10 miles, also a low green light. The high white light is shown all night; a low green light for 15 feet and upwards; a low white light for 13 feet and not 15; a low red light for 10 feet and not 13.

A green light, visible 3 miles, is shown from a wooden structure of stone colour, on the E. pier all night, to assist vessels entering between the piers.

DAY SIGNALS.

15 feet and upwards	...	...	a red flag and one black ball.
13 feet and not 15	...	...	a red flag.
10       "       "       13	...	...	two black balls.
8       "       "       10	...	...	one black ball.

The two fixed lights in one, bearing N.  $\frac{1}{2}$  W., is the fairway of the entrance, from whence N.  $\frac{1}{2}$  E. leads up to the harbour.

**TIDES.**—The tide flows up the river 3 hours, and down 9 hours; it is high water, F. and C. at 11h. 51m. Springs rise 20 feet, neaps 15 feet; and mariners should observe that the stream runs inshore from the eastward about an hour before high water; of which circumstance they may take advantage to enable them to weather the harbour.

By the recent improvements of this harbour, it has become the best tide-harbour in the Channel between Harwich and the Isle of Wight; it is situate between the shore of Seaford on the E., and Burrow Cliff on the W.; and by these the track may readily be known. Seaford Cliff, in running in, shows white, with a green patch in the middle; and Burrow Cliff shows itself in a reddish copper-colour, over the white chalk, each cliff appearing at the end of each cheek of the bay.

Nearly half a mile to the eastward from the piers are the tide-mills, a building of yellow brick, which appears high over the beach when coming in. The piers which form the harbour are 150 feet apart; between them, at low water spring-tides, the depth is only 2 feet; but at high water, in good neap-tides, there are 14 feet; and with spring-tides, from 20 to 24 feet. The beach is, at all times, shifting about the mouth of the harbour, so that no solid mass ever remains long together. Extending from the western side of the E. pier is a sort of low dicker-work about 3 feet high. When vessels can run over the shifting poles, or spits, outside, they can go over this dicker-work; but it is recommended always to keep in mid-channel in the harbour, by which the said work is avoided. A gridiron in the harbour will take a vessel of 600 tons and 200 feet long.

The bay is one of the finest roads in the Channel, with the wind from N.N.W. to E. by S.; the soundings are generally very regular. If a vessel in running for the harbour, through rough weather, should chance to get at the back of the E. pier, she is not likely to receive any material injury; vessels thus situate have frequently been got off the next tide without damage; but for many years few accidents have occurred.

Pilots for the harbour are stationed at the piers. Every assistance is rendered, by means of capstans, ropes, &c., free of expense; and as a guide to the harbour, when vessels can enter, a flag is waived on the W. pier. The poles or spits at the entrance seldom extend further off than from 100 to 300 feet.

**BRIGHTON** is nearly 8 miles to the westward of Newhaven, is well known as "LONDON SUPER MARE," and extends along the coast for 3 miles, fronted by a sea-wall 60 feet in height, with a central valley. The principal buildings are the Pavilion, St. Peter's Church, the old St. Nicholas or parish church, the Town Hall, the Suspension Chain Pier, with the new Aquarium adjoining, and the Royal Pier more to the westward, and is connected by railway with many important places, being 50 $\frac{1}{2}$  miles from London, and 44 from Portsmouth.

The Suspension Chain Pier is the easternmost of the two piers, and extends into the sea to the extent of 1,014 feet. The new pier is erected further to the

westward, and extends 1,000 feet into the sea, and is a broad promenade, with saloons for shelter and refreshment, and is much patronised by the inhabitants and visitors.

**Lights.**—On the end of the Chain Pier is a green light, shown from a light-house 22 feet in height and 35 feet above the sea, visible 10 miles; and at the end of the new pier is a red light, visible 5 miles.

It being important that the works should not be injured by vessels navigating along the coast, masters of vessels, pilots, and others, are warned not to approach the shore in foggy weather nearer than 5 fathoms depth.

**JENNY GROUND ROCKS.**—About  $2\frac{1}{2}$  miles westward of Brighton is a ledge of rocks extending about three-quarters of a mile from shore, called the Jenny Ground Rocks, upon which is not more than 7 feet at the last quarter ebb. This may be avoided by day by keeping Lancing Mill open to the southward of Shoreham Church, and by night by going into no less than 5 fathoms, until the high light at the harbour bears N.N.W. Shoreham Church is about a mile to the westward of the pier; it has a square tower, its roof appearing white, and may be seen at some distance. Coming from the westward, after passing Worthing Point, it will appear on the E. side of a deep valley. To go to the westward of Jenny Ground Rocks, bring Portslade mill on with the houses in Copperas Gap.

In approaching Shoreham Piers from the westward, care should be taken to avoid the Grass Bank and Brill Rocks, which lie to the eastward of Worthing. This is a flat ground, and extends off a long way; but there is no danger if, when approaching the shore, the lead is kept going. The Church and Dutch Rocks must also be carefully avoided; they are two clusters of rocks, lying about  $1\frac{1}{2}$  mile to the westward of the piers. The highest of the Church Rocks shows at low spring ebbs, and is about a quarter of a mile from low water mark. The marks for it are, the E. end of the church on with the high chimney standing S.-westward of it; and the Sussex Arms Inn, on with the S. end of the E. pier, bearing E.  $10^{\circ}$  S. The Dutch Rocks lie about a cable's length W.N.W. from the Church Rocks, having 6 to 7 feet between them at low water.

**NEW SHOREHAM HARBOUR.**—**Lights.**—The entrance of this harbour lies N.W.  $\frac{1}{2}$  W., 19 miles from Beachy Head; 4 miles N.W. by W.  $\frac{1}{2}$  W., from the chain pier at Brighton, and E. by N.  $\frac{1}{2}$  N., about 20 miles from the Owers light. There are two light-houses, which, kept in a line bearing N. by E.  $\frac{1}{2}$  E., lead in between the piers; the low light-house is 23 feet above the level of high water, spring tides, and stands on a point called the light-house point, facing the centre of the opening which separates the eastern and western harbours; the high light-house exhibits a bright fixed light, visible 10 or 12 miles, and is 750 feet behind the lower light-tower, and is 42 feet above high water spring tides. The high light will burn from sunset to sunrise; the low light-house shows the following tidal signals, viz.: A GREEN light when there is from 8 to 11 feet on the tide-gauge at the middle pier, with a flowing tide. A WHITE light when there is over 11 feet on the tide gauge. A RED light during high water slack tide.

Two fixed green lights are also shown from the outer extremities of the east and west piers, in addition to the leading and tidal lights. Vessels approaching Shoreham Harbour should keep the high leading light open eastward of the western pier green light, and when clear of the west pier-head, keep as near the pier as practicable until the leading lights again come in line. Attention must be paid to the set of the tide.

As DAY SIGNAL, a red flag will be hoisted on a flagstaff, on the top of the low light-house, so soon as a vessel drawing 11 feet can enter the harbour, and will remain so hoisted until near high water, when it will be hauled half-staff down, that being the proper time for vessels to run for the harbour; and not till then should ships attempt to enter, unless they are well acquainted.

Ships should, so soon as they have passed between the pierheads, which are 176 feet apart, steer along by either pier, according to which branch of the harbour *are going*, to prevent running on the Light-house Point, on which the tide *is very strong*. If bound into the western branch, and having passed the Light-

house Point, the black buoys must be left on the port hand; and if bound into the eastern branch, the black buoys must be left on the port, and the red buoys on the starboard hand.

A steam tug-boat is stationed at the harbour. The charge for towing is 2½d. per register ton; this includes into and out of the harbour. The depth of water in the harbour is 21 feet ordinary spring-tides, and 15 feet ordinary neap-tides.

There is a canal in the eastern branch of the harbour, about 1½ mile in length, terminating with a basin at the eastern end, 500 feet in length, and 250 feet in width. The entrance lock is about half a mile from the entrance to the harbour. It is 175 feet in length between the gates, 33 feet in width, and will have a depth of water over the sills of 21 feet ordinary spring-tides, and 15 feet ordinary neap-tides.

A jetty is erected 110 feet westward of the W. pier, on a level with the top of the piers, and extends 200 feet S. of the pier-heads, which smoothenes the water at the entrance of the harbour, and makes it easy of access in westerly gales, and also keeps the harbour's mouth clear of shingle.

TIDES.—It is high water at the E. pier-head, on full and change, at 34 minutes past 11 o'clock; mean spring-tides rise about 18 feet, and neaps 13½ feet. On quarter days, it is high water at 4 o'clock, and mean neap-tides rise about 9 feet.

It is to be observed, that the ebb-tide sets strongly to the westward, in shore, nearly 2 hours before it is high water at the pier-head; so that ships with westerly winds may avail themselves of it to get to the westward, by making short tacks near the shore. The flood near the shore makes to the eastward, before low water in like manner.

In blowing weather (by night), when pilots cannot get off, vessels should keep their light hoisted, until they get into the harbour, and a pilot on board. Pilots are always ready to board vessels on arriving off the port; and in boisterous weather, when they cannot get to sea in their own boats, they have the gratuitous use of a life-boat belonging to the Harbour Commissioners, and kept under the care of the harbour-master.

The following Code of Signals is used at the Harbour of New Shoreham and Little Hampton.—

SIGNALS.	SIGNIFICATION.
1.—A single ball at the mast-head.....	A general answer or acknowledgment.
2.—Two balls at the mast-head .....	8 ft. on the bar with a flowing tide.
3.—Three balls at the mast-head .....	9 " " " " "
4.—One ball at the outer yard-arm ...	10 " " " " "
5.—Two balls at the outer yard-arm ...	11 " " " " "
6.—Three balls at the outer yard-arm	12 " " " " "
7.—One ball at the inner yard-arm.	13 " " " " "
8.—Two balls at the inner yard-arm ...	14 " " " " "
9.—Three balls at the inner yard-arm	15 " " " " "
10.—A single ball at each yard-arm ...	16 " " " " "
11.—A pendant at the mast-head .....	It is now slack tide.
12.—A pendant and one ball under, at the mast-head .....	16 feet with an ebbing tide.
13.—A pendant and two balls under at the mast-head .....	15 " " "
14.—A pendant at mast-head, and one ball at outer yard-arm .....	14 " " "
15.—A pendant at mast-head, and two balls at outer yard-arm .....	13 " " "
16.—A pendant at mast-head and three balls at outer yard-arm .....	12 " " "
17.—A pendant at mast-head and one ball at inner yard-arm .....	11 " " "

### Signals, continued.—Shoreham and Little Hampton.

- 18.—A pendant at mast-head and two balls at inner yard-arm .....
- 19.—A pendant at mast-head and three balls at inner yard-arm .....
- 20.—A pendant at the outer yard-arm...
- 21.—A pendant with one ball under at the outer yard-arm .....
- 22.—A pendant with two balls at the outer yard-arm .....
- 23.—A pendant between two balls at the outer yard-arm .....
- 24.—A pendant under one ball at the outer yard-arm .....
- 25.—A pendant under two balls at the outer yard-arm .....
- 26.—A pendant at the inner yard-arm...
- 27.—A pendant with one ball under at inner yard-arm .....
- 28.—A pendant with two balls under at inner yard-arm .....
- 29.—One ball with pendant under at inner yard-arm .....
- 30.—Two balls with pendant under at the inner yard-arm .....
- 31.—Two balls at the outer and one ball at the inner yard-arm .....
- 32.—One ball at the outer and two balls at the inner yard-arm .....
- 33.—Two balls at the mast-head and one ball at the outer yard-arm ...
- 34.—Two balls at the mast-head and one ball at the inner yard-arm ...
- 35.—One ball at the mast-head with pendant under .....
- 36.—Two balls at the mast-head with pendant under .....

These signals are shown on a flagstaff, or mast and yard, at the middle pier, 23 feet N. of the former flagstaff. Mariners are to observe, that these signals do not interfere with the red harbour-flag and staff, which flag is hoisted as usual. The balls used are of canvas, 2 ft. in diameter, and painted black; the pendant blue and white, horizontally, 22 feet long.

### Signals to be used by vessels off Shoreham Harbour.

#### SIGNALS.

- 1.—Ship's ensign at main-top-gallant-mast-head .....
- 2.—One ball at fore-top-gallant-mast head .....
- 3.—One ball at main-top-gallant-mast-head .....
- 4.—One ball at fore and ensign at main-top-gallant-mast-head .....
- 5.—One ball over ensign at main-top gallant-mast-head .....

10 feet with an ebbing tide.

9 " " "  
16 " " "

There is not water enough on the bar.

Keep to the eastward.

Keep to the westward.

{ The signal cannot be made out; the flag  
is foul, or hid by the upper sails.  
{ The depth of water will be shown at  
every foot, rise or fall.  
Assistance will be sent immediately.

Pilots cannot go to sea.

{ Pilots will be sent when a boat can  
pass the bar.  
{ Pilots are all engaged; but one will  
be sent as soon as possible.  
{ The owner wishes his vessel to bear  
up for shelter.  
{ The owner does not wish his vessel to  
risk the bar.  
{ Pilots will be on the pier, if the ves-  
sel attempts the bar. The depth of  
water will be shown.

It appears a vessel might stem the tide.

{ The tide runs so strong, that a vessel  
may not be able to stem the tide.

The tide is ebbing.

The tide is flowing.

#### QUESTIONS AND SIGNIFICATIONS.

Show the depth of water.

Is the tide flowing?

{ I am compelled to venture the bar  
without a pilot.

I am compelled to bear up for shelter.

Can the vessel stem the tide?

## Signals, continued.—Shoreham Harbour.

## SIGNALS.

## SIGNIFICATION.

6.—One ball over ensign at fore-top-gallant-mast-head.....	Send a boat and hands to assist.
7.—Ensign over one ball at main-top-gallant-mast-head .....	I have lost an anchor and cable.
8.—Whift, viz. :—Ensign with one stop at main-top-gallant-mast-head ...	The vessel is leaky ;

N.B.—Vessels making signals, are immediately to haul them down when answered and understood. Each vessel should be supplied with a canvas ball ; in default of which, a bucket, or boat's sail rolled up snug, will do for a shift, or a cork fender.

WORTHING.—About W.  $\frac{3}{4}$  N. from New Shoreham is the watering-place of Worthing. Here are some beautiful sands at low water, and a pier is run out, upon the end of which a white light is exhibited.

Kingston Rocks lie about W.,  $3\frac{1}{2}$  miles from the pier at Worthing, about a mile from high water shore, with 9 feet upon the shoalest part ; and about three-quarters of a mile further W. is another spot of 2 fathoms.

The Kingsmere Rocks, having  $4\frac{1}{2}$  to  $5\frac{1}{2}$  fathoms upon them, are some Lobster Grounds ; they lie nearly 5 miles off the land, the E. end W. by S.  $\frac{1}{4}$  S. from Shoreham Harbour, distant 10 miles ; the W. end, in  $4\frac{1}{2}$  fathoms, bears S. from Little Hampton, distant 5 miles. They extend in a N.W. by W.  $\frac{1}{2}$  W. and S.E. by E.  $\frac{1}{2}$  E. direction, about  $2\frac{1}{2}$  miles. Between these rocks and the shore there are two or three patches of  $3\frac{1}{2}$  fathoms at low water.

LITTLE HAMPTON.—The entrance to ARUNDEL lies  $11\frac{1}{2}$  miles W. by N. from the entrance to New Shoreham, and 10 leagues N.W. by W.  $\frac{1}{2}$  W. from Beachy Head.

Little Hampton lies at the entrance of the River Arun, which leads up to Arundel. Two piers run out from the harbour, which are 125 feet apart ; the western pier being carried out 200 yards further than the eastern one, and beyond each pier is a low dicker work, which extends to nearly low water mark. A row of warping posts is driven into the sand about 20 feet eastward of the dicker work, each end being marked by a bush beacon.

Within the entrance at high water springs, the depths are :—16 feet in the fairway of the outer warping post ; 15 feet abreast of the bush beacon on the end of the low western dicker work ; 17 feet between the piers ; 16 feet abreast the mill, and 18 to 16 to the ferry at Little Hampton. Vessels of 13 or 14 feet can proceed to Arundel by being towed.

Little Hampton town is about three-quarters of a mile within the entrance of the Arun, and was the ancient town of Arundel. There is a dry dock on the town side, a ship yard on the western shore, with a patent slip. The dock is 110 feet long, 30 feet wide between the gates, with 9 feet over the sill at high water springs, and 5 at neaps. The patent slip is 400 feet long and can take a vessel 400 tons.

Lights.—On the N. end of the E. pier at the entrance of the harbour, is a white light-house, with dome painted green, showing a red fixed light at an elevation of 30 feet above high water, and visible 7 miles.

The following lights are placed on the S. end of the E. pier to show the depths of water, and when in one with the above red light bearing N. lead to the entrance. A white light indicates that their are 10 feet between the piers ; a green light, 11 feet ; a red light, 12 feet ; a red and white light vertical, 13 feet, two white lights vertical, 14 feet, and a white and green light, vertical, 15 feet. These lights are extinguished at high water.

Tides.—At Little Hampton it is high water, full and change, at 11h. 36m. Spring tides rise 16 feet, neaps  $11\frac{1}{2}$  feet ; and neaps range 7 feet. The general depth over the bar is  $14\frac{1}{2}$  to  $15\frac{1}{2}$  feet at high water springs, and  $9\frac{1}{2}$  to 11 feet at neaps, and allowance for 2 feet more may be made for the dredging since this data. At Arundel it is high water at 12h. 25m. After heavy rains up-country, there is a constant downward current.

[E. CHANNEL.]

The flood runs into the harbour with great strength until one hour after high water, but from half-flood to half-ebb, outside the eastern pier it sets strongly to the westward ; and this should be noted when going in or out, so as to avoid being set on the western jetty work.

The tidal signals are made from a white signal mast at the north end of the east pier. They are exactly similar to those used at New Shoreham, and give the depth in feet at the entrance.

**Directions.**—Vessels approaching the entrance of the harbour should bring the outer warping post in one with the light-house bearing north, and keep about a ship's length westward of outer posts. However, very few vessels will have occasion to run for the harbour without a pilot, as they are always in attendance and come off in all weathers that it is possible to do so.

When the weather will not permit a pilot to go on board, there will be one on the eastern pier, who, with a flag, will wave and direct the vessel in ; and also one with a boat between the piers, who will board as soon as a vessel gets within the breakers.

Vessels drawing less than 10 feet may anchor off Little Hampton in what is termed the Two Fathoms Hole, providing the sea is smooth, with the outer warping post in one with the mill near the harbour, N.  $\frac{1}{4}$  E., and Cisebury Hill opening south of the crest of Highdown Hill ; or at a mile from the piers in 13 feet water, chalk and gravel, with Salvington Mill in line with the chalk-pit of Highdown. If the vessel draws 17 feet, she may anchor with the entrance open, distance about  $1\frac{1}{4}$  mile, with Chantonbury grove over the western chalk-pit of Highdown, in 19 or 20 feet. If you happen to have a pilot on board, they sometimes take you to a berth further to the westward. If the wind is easterly and a vessel requires to anchor before entering the river, a good place is off Rustington Mills, as the stream will set to the westward by the time there is water to enter.

**DANGERS near Little Hampton.**—**Winter Knoll Buoy.**—This is a shoal spot of ground lying off Little Hampton, with only 8 feet on it, about  $1\frac{1}{4}$  mile from shore, near which is a black buoy, marked "Winter," in 17 feet, with the Shelly Buoy W. by N.,  $1\frac{1}{4}$  mile ; and Little Hampton Church Tower N.E.  $\frac{1}{2}$  N.

**Shelly Rocks, Buoy.**—There is also a patch, called the Shelly Rocks, nearly dry,  $1\frac{1}{4}$  mile from the shore, on the outer or southern end of which a red and white buoy is placed, in 3 fathoms, with Arundel Church bearing N.E.  $\frac{1}{4}$  N., and open to the eastward of Elmer Preventive Station ; Middleton Church N.N.E.

About  $3\frac{1}{4}$  miles west of Little Hampton is Middleton Ledge, a low and straggling ledge of rocks, projecting a short distance outside the general line of low water mark, about midway between Feltham Mills and Middleton Church. The ledge extends shallow in depths of 4 to 6 feet in a S.S.E. direction towards the Shelly Rocks, and between it and the Shelly is a passage of 11 feet water ; but no vessel drawing more than 9 feet should navigate at low water inshore of the Shelly and Winter Rocks.

**Bognor Rocks.**—More than half-way between Little Hampton and Pagham a ledge of rocks runs off a mile from the shore. As these rocks are dangerous, ships, when turning into the Park, must be careful to avoid them ; they run off S.E. from Bognor, and are called the Bognor Rocks. Felpham white mill on with grove E. of Rocks-hill bearing N. leads E. of these rocks, and Pagham watch-house open N. of Pagham Church N.W. by W.  $\frac{1}{4}$  W. leads S. of them.

These dangers will be avoided by keeping Dunnose well open of Selsea Bill, and the watch-house open N. of Pagham Church N.W. by W.  $\frac{1}{4}$  W. leads S. of them, in a depth of 4 fathoms.

In sailing westward from Beachy Head, you may stand into 12 fathoms ; between Seaford and Shoreham to 7 fathoms, anchoring anywhere in 8 or 9 fathoms. W. of Shoreham stand on into 8 or 9 fathoms, and on approaching the Owers, come not nearer than 20 or 19 fathoms, especially in dark or foggy weather.

**The Park.**—Between the Bognor Rocks to the North and the East Bank and Eastborough Head, of the Owers Shoals to the south, and sheltered by Selsea Bill, and Pagham land on the N.W., is the anchorage called the Park, while to the S.W.



it is protected by the Mixon Rocks and Middle Owers Shoals ; but it affords no protection and becomes unsafe with the wind anything to the eastward of south. The anchorage is not fit for large vessels, owing to the frequent and sudden shifts of wind, and sudden sea which gets up on those occasions. Small vessels anchor with the Mixon beacon W.S.W., and Pagham watch-house on with Chichester Spire in 3 fathoms. Larger ships further out and more to the eastward. The nearer the Mixon is approached, the stronger the tides.

The OWERS.—Selsea Bill lies 11 miles W.  $\frac{1}{2}$  S. of Little Hampton, and to the southward of Selsea Bill are the Owers, a variety of shoals composed of several ledges of hard, black rocks, of which the East Bank is the N.E. part, having 19 feet shoalest water.

EAST BANK BUOY.—This is a black-and-white chequered buoy, with staff and cage ; laid a short distance from the 19 feet spot, with Selsea Mill in one with Selsea Coast Guard Watch-house N.W.  $\frac{1}{4}$  N. ; and Nye timber windmill a little open eastward of Chichester Spire, N.  $\frac{1}{2}$  W.

EASTBOROUGH HEAD.—This dangerous part of the Owers shoal lies 1 mile west of the East Bank and has but 1 fathom on its shoalest part, with  $1\frac{1}{2}$  and  $2\frac{1}{2}$  fathoms on the other parts, which are to the S. by E. one-third of a mile ; N.W. by N. a quarter of a mile ; and W.  $\frac{1}{2}$  S.  $\frac{1}{10}$  of a mile from the shoal part. From the shoal part of the head, Selsea Church bears N. by W.  $\frac{1}{4}$  W., distant 5 miles ; beyond this in the direction of W.  $\frac{1}{2}$  S. from the shoal part, the Outer Owers extend to the West Head, where there are  $2\frac{1}{2}$  fathoms ; this is nearly  $1\frac{1}{2}$  mile from the 6 feet Rock.

From Eastborough Head, the Owers take a turn to the S. by W.,  $1\frac{1}{2}$  mile to the Shoal of the Lead, a portion of the Owers Shoal lying S. by W. from the 6 feet rock of the Eastborough Head, and having only 3 feet on the shoalest part. This Shoal of the Lead is the shallowest part of a large flat of  $2\frac{1}{2}$  to 3 fathoms which continues half a mile to the southward of the Eastborough Head, to the Elbow of the Owers Shoals, having there  $3\frac{1}{2}$  fathoms, to within little more than half a mile of where the Light-vessel rides. From this position on the Elbow, Selsea Church bears N.  $\frac{1}{2}$  W., distant nearly 7 miles ; and Dunnose, W. by N., northerly 19 miles.

Light-Vessel.—S.S.E., half a mile distant from the Elbow of the Owers and S.S.W.  $\frac{1}{2}$  W.,  $2\frac{1}{2}$  miles from the chequered buoy of the East Bank, is the Owers Light-vessel, moored in 19 fathoms with the E. end of a round clump of trees in line with Pagham Church, N., easterly, E. Bank chequered buoy N.N.E.  $\frac{1}{4}$  E. ; Mixon beacon N.N.W.  $\frac{1}{4}$  W. ; and the Nab Light-vessel N.W.  $\frac{3}{4}$  W., distant 13 miles.

This vessel exhibits a revolving light, showing white and red flashes at intervals of half a minute, in the order of two white and one red.

A powerful Daboll's fog signal will be sounded during foggy weather ; it will give forth six blasts every minute. And a gun is fired if a vessel is seen standing into danger.

CAUTION.—All vessels bound down Channel should be careful and keep to the southward of the Light-vessel. This may easily be done by observing, in approaching her from the eastward, not to bring the light to bear more northerly than W.N.W. ; and having passed her to the westward, and bound into Spithead, be careful not to steer more northerly than N.W.  $\frac{1}{2}$  W., lest it lead upon the W. end of the Owers, called the Boulder Bank. The Red Clay Cliff in Sandown Bay (Isle of Wight), open S. of Culver Cliff, N.W. by W.  $\frac{1}{2}$  W., clears all the Owers Shoals to the southward. In coming up Channel, vessels will find no difficulty in observing the above directions in a contrary order.

To vessels going down Channel, which, by contrary winds, are obliged to bear up for anchorage in the Park, a bearing of the Owers Light will be extremely useful to keep them clear of Eastborough Head, and the East Bank ; in order to do which keep to the eastward of the light at a convenient distance ; but, having passed it, be careful not to bring it more southerly than S.W. by S. ; and having run about 4 miles to the northward of it (keeping the lead going), then, and not till then, haul up more westerly for anchorage in the Park.

Bersted Church, which has a spire, in line with a grove of trees on Goodwood Downs, N.  $\frac{1}{2}$  E., clears the E. Bank on the E. side.

About three-quarters of a mile to the southward of the Owers is a spot of rocky ground, called the Hooe, but with not less than 8 fathoms over it.

**MIDDLE OWERS.**—From the West Head, distant two-thirds of a mile, W.  $\frac{1}{2}$  S., is the E. end of the Middle Ground, or Middle Owers, between which is a swatchway, of 4 to 6 fathoms. This Middle Owers Shoal extends in a N.W. by W. direction,  $3\frac{1}{2}$  miles to the S.W. corner of the Boulder Bank. It consists of several rocky heads having as little as 6 to 3 feet in some parts over the heads, but having two very narrow breaks or gullies across the shoal, which, at most, in the shoal parts, is not half a mile across.

**Buoy.**—A can buoy, chequered black-and-white, is placed in  $4\frac{1}{2}$  fathoms, on the N.E. part of the Middle Owers, on the W. side of the swatchway, with Pagham Church N. by E.  $\frac{1}{2}$  E., and Felpham Church N.E. easterly.

**THE BOULDER.**—The Boulder Bank is small and dangerous, having only from 1 fathom to 1 foot upon it, and as before observed, is the S.-western danger of the Ower's Shoals, which then bend to the N.-eastward past the Pullar Buoy, and by the Brake or Cross Ledge is joined to the Grounds or Malt Owers; and it is over this Brake or Cross Ledge that the deeper water is found forming the passage from the Looe Stream to Spithead. The shoal part of the Boulder Bank, Pullar and Cross Ledge, is narrow, not above a quarter of a mile in breadth, deepening gradually into 5 and 6 fathoms on either side.

**Buoy.**—A black conical buoy is placed on the S.W. end of the Boulder Bank, in 10 fathoms, with Medmery barn in line with Chichester spire, N.E. by N.; Nab light-vessel, N.W.  $\frac{1}{2}$  W.,  $6\frac{1}{2}$  miles; Pullar Buoy N.E., 1 mile; and Ower's light-vessel, S.E.  $\frac{1}{2}$  E.,  $6\frac{1}{2}$  miles.

**Buoy.**—The PULLAR is a conical buoy striped black and white, vertically, and lies on the N.E. end of the Boulder Bank, marking the Brake or Cross Ledge; and is laid to the southward of the deeper water, across the ledge, in about  $2\frac{1}{2}$  fathoms, with Selsea Bill, N.E. by N., and Selsea watch-house N.E. by E.  $\frac{1}{2}$  E.

The banks, already described in connection with the Owers Shoals, form the southern boundary of the LOOE STREAM, which is bounded on the north by the Mixon, the Dries, and the Grounds (or Malt Owers). These latter shoals are situate close off the point of Selsea Bill, and continue away eastward in shoal water past Pagham Harbour to join the Bognor Rocks; and to the N.-westward to join the Streets and Hounds Rocks, on the western side of Selsea Bill.

**THE MIXON** is a narrow ridge of dry rocks lying off the extremity of the dry sand that extends from Selsea Bill a full mile in a S.S.E. direction; the dry rocks of the Mixon extend seven-tenths of a mile W.N.W. and E.S.E., and dry at the last quarter ebb, and is marked at the E. end by a beacon, to the southward of which is what is called the Hole, a small space of sudden depth of water, for within  $1\frac{1}{2}$  or 2 cables' length to the southward of the beacon are 8 fathoms, while the N.E. and S.W. are 7 and 6, and 8 and 5 fathoms, then again shoaling S.-eastward and southward to  $3\frac{1}{2}$  and 3.

**Beacon.**—The beacon of the Mixon is erected on the highest part of the rocks close to the eastern end, is 28 feet above high water mark, and surmounted by a triangular framework, and forms a valuable sea-mark for the outlying dangers, and a useful object for those vessels that are obliged to use the Looe Stream.

**THE GROUNDS, OR MALT OWERS, THE DRIES, THE STREETS, AND THE HOUNDS.**—The whole of these rocks are situate to the westward of the Mixon; but the most dangerous and nearest connected with our description is the Dries, part of which Dries is marked by a buoy. The outermost of these rocks lies about  $1\frac{1}{2}$  mile from the beacon on the Mixon, on a prong of shallow sand, not having more than 3 feet at low water, and are about the same distance from the shore; the rocks then take a semi-circular direction for three-quarters of a mile, and there called the STREETS, and join the shore near to the coast-guard and high house to the westward of Selsea Bill. Within this semi-circular space there is a two-fathom hole, about half a mile in extent, wherein may be found  $2\frac{1}{2}$  and  $2\frac{1}{2}$  fathoms at low water. *These rocks, and the dry sand from Selsea Bill, block up the passage between the shore and the Mixon, excepting at high water, and for those acquainted with it.*

**Buoy.**—A black buoy is laid down about a quarter of a mile southward of the Dries, in about 7 feet water, with Rook's Mill on with the high house at Selsea Street N.N.E.  $\frac{3}{4}$  E.; and Nelson's Monument, in line with the W. end of Hayling Trees, N.N.W.  $\frac{3}{4}$  W.

**THE HOUNDS** are a similar ledge of dry rocks, extending a mile westward from the sea shore, opposite Medmery Barn, and are about a mile to the northward of the Streets.

**MEDMERY BANK.**—This is a name given to a bank of  $2\frac{1}{2}$ ,  $2\frac{1}{2}$ , and  $2\frac{3}{4}$  fathoms, the shoalest water to the extent of a mile N.W.  $\frac{3}{4}$  N. and S.E.  $\frac{3}{4}$  E., and nearly half a mile in an opposite direction; and from thence gradually going off into the average surrounding depths. The eastern edge of this bank is about three-quarters of a mile to the westward of the Grounds or Malt Owers, with 6 and 8 fathoms between, and W.N.W.,  $2\frac{1}{2}$  miles from the beacon on the Mixon. A good mark to clear this bank to the westward is the N. end of Chalk Pit, on Portsdown Hill, in one with the S.W. end of Hayling Trees; this will lead in 4 fathoms.

The Marks for these shoals are as follow:—

To clear the whole of these shoals to the eastward, bring Chichester Church in one with the W. end of Plantation on Bow Hill N.  $\frac{3}{4}$  W.; this leads nearly half a mile to the eastward of them.

At the Shoal of the Lead, Chichester Spire appears half-way between Pagham Church and a single tree, which is a remarkable object near the coast, a short distance to the eastward of the church, N.  $\frac{3}{4}$  E.

**Swatchway.**—Between the West Head and the Middle Ground there is, as before-said, a swatchway into the Looe Stream, the mark to go through which is the White Way on Bow Hill, on with Selsea Corner, N.  $\frac{3}{4}$  E. Mixon Beacon in one with the coast-guard station westward of Selsea, bearing N. by W.  $\frac{3}{4}$  W., leads through the swatchway, and clears the Elbow; and when coming from the westward, Kinnaird House in one with Clarence Hotel near Bognor N.E.  $\frac{1}{4}$  N., also leads through the swatchway and clears the Middle Owers.

To clear the Boulder and Brake bring Chichester Spire on with the W. end of Medmery Barn N.E. by N.

To go to the southward of all the dangers in the vicinity of the Owers, look out for the mark previously given, viz., to bring the Red Clay Cliff in Sandown Bay open south of Culver Cliff.

**THE LOOE STREAM.**—In order to facilitate the navigation of vessels passing through the Park and Looe Stream, the black-and-white chequered buoy was placed to the eastward of the East Bank. There is a channel with 5 fathoms in it between the buoy and Eastborough Head, but large vessels should pass east of the buoy.

At the western boundary of the Looe Stream the two buoys, noticed in page 36, have been laid down, and these much facilitate the navigation of the passage at the western entrance of the Looe Stream. The course through the Looe Stream from the eastward is W. by N., from half a mile northward of the chequered East Bank buoy, until you bring the beacon on the Mixon to bear N. by W.  $\frac{3}{4}$  W.; then N.W. by W.  $\frac{1}{4}$  W., 3 miles, will carry you over the Brake or Cross Ledge, into 7 or 8 fathoms water. In this track, from the eastward, you will get a fair set of the tide until 2 hours before low water; and, in taking the stream on the flood to the eastward, the flood-stream will favour until about  $1\frac{1}{2}$  hour or so before high water.

By the late survey of the Looe, it appears that some patches of  $2\frac{1}{2}$  fathoms have grown up, between the Mixon beacon and the East Bank buoy on a S.E. by E.,  $2\frac{1}{2}$  miles from the beacon, and N.W. by W. bearing,  $1\frac{1}{2}$  mile from the buoy, having  $3\frac{1}{2}$  to 4 fathoms round them, but at present these will not take up any vessel that would cross the Brake.

**TIDES.**—At Selsea Bill springs rise  $16\frac{1}{2}$  feet, neaps  $12\frac{1}{2}$ . High water, full and change, at 11h. 45m.

**Directions.**—After passing to the northward of the buoy of the East Bank, the course to the entrance of the Looe Stream is, on a flowing tide W.N.W. Do not come to the westward of the buoy until you round it to the northward.

The leading mark to sail through the Looe Stream and over the Cross Ledge, on a rising tide, is the top of Little See-me-not just opening to the southward of Culver Cliff, taking care not to open or shut any more of it, but endeavour to keep one-half of it in sight: be sure not to mistake this mark, which has sometimes been the case even with persons well acquainted with the Looe, by supposing the mark to be another hill, called the Great See-me-not, open of Culver Cliff, not being aware of the danger of opening the Great See-me-not, until they get aground on the Boulder Bank, where Great See-me-not is indeed open of the Culver Cliff; whereas, to sail in the best water, it ought to be shut by Culver Cliff, it being to the northward of Little See-me-not. When Little See-me-not just appears opening south of Culver Cliff W. by N.  $\frac{1}{2}$  N., it will lead up to the beacon-buoy on the Pullar, and over the cross ledge in 14 feet, at low-water spring-tides; always pass to the northward of the buoy.

Observe, in coming from the westward, with flood-tide and little wind, the stream sets obliquely across the direction of the leading mark and towards the Boulder, which must be particularly attended to when to the westward of the Cross Ledge; for, without a commanding breeze, you will be in danger of being drifted on the Boulder.

**TIDE IN THE LOOE STREAM.**—At the W. entrance near Pullar Buoy, at F. and C., the eastern stream makes at 3h. 45m., and the western stream at 10h, and sets S.E. and N.W. At the eastern entrance near Eastborough Head, the eastern stream makes at 4h. 40m., and sets E.N.E.  $\frac{1}{2}$  E.; and the western stream at 9h. 50m. sets W. On the S. side of the Pullar the tides set E.S.E. and W.

Ships intending to anchor in the Park, will get the mark of the White Way on with Chichester Spire, observing to pass to the eastward of the buoy on the E. bank, and run on until See-me-not comes quite on with Culver Cliff, when they will haul up to the N.W., and anchor in  $4\frac{1}{2}$  or 5 fathoms, with Selsea Bill from W. to W.N.W., but in dark weather, when these marks cannot be distinguished, keep to the eastward of the light-vessel, with the lead going, being careful not to bring her to the southward of S.W.  $\frac{1}{2}$  S., until you are 4 miles beyond her, or past the buoy; then steer for the anchorage and anchor in 6 or 7 fathoms, with Chichester Spire W. of Bow Hill, and Mixon beacon W.  $\frac{1}{2}$  N. or nearer in less water 4 or 5 fathoms, with Mixon beacon bearing W. by S.

To sail out of the PARK through the Looe Stream, having calculated the time of tide for your draught of water, do not bring Pagham Church to the eastward of N.N.E. until you get the mark for running through the Looe Stream; then steer for the Cross Ledge between the two buoys before mentioned, passing at one-third of the distance from the beacon-buoy on the Pullar you will find the best water; when over the Cross Ledge, and deepened your water to 6 or 8 fathoms, or have Chichester Spire on with the W. end of Medmery barn, you may steer for St. Helen's or Spithead.

Ships bound up or down channel, should be careful not to come too near the Owers, more especially in light winds or thick weather. As you will have 18 fathoms within  $1\frac{1}{2}$  mile of the E. end of this dangerous bank; it is not safe, especially when there is a little wind, and the weather foggy, to approach any nearer to it than 20 fathoms.

**CHICHESTER HARBOUR** lies  $6\frac{1}{2}$  miles N.W. by N. from Selsea Bill. Vessels bound into this harbour, and having passed the Brake or Cross Ledge, must beware of the Medmery Bank, the least water on which is  $2\frac{1}{2}$  fathoms: this lies with Lord Kinnaid's house just open to the westward of Medmery farm-house; and the S.W. side of Portsdown chalk-pit on with the S.W. end of Hayling trees. The bank is narrow, and stretches in the direction of the shore about a mile, having 3 and  $3\frac{1}{2}$  fathoms over its northern end; it is 2 miles from the shore. Within Medmery Bank, and close to the shore is the Hounds Rock, already noticed, the depth from which to the Medmery Bank is 2, 3, 5, 7, 6, 5, and 4 fathoms.

Chichester Bar bears N.E., 4 miles from the Nab light-vessel, and 3 miles from the Dean Tail black beacon buoy; to sail over the bar, you must take a pilot both in and out. The mark is, the Watch-house on Watch-house Point, in line with a

remarkable plantation to the eastward of Bow Hill, N.E. by E.  $\frac{1}{2}$  E.; in that direction you will have  $4\frac{1}{2}$  feet, but in some parts are 5 and 6 feet. When waiting for a pilot or sufficient water over the Bar, keep Haslar Hospital open of Southsea Castle, or anchor with these marks in 3 or 4 fathoms, according to wind. The channel is between the East and West Pole, but so extremely narrow, and so liable to alter, that strangers will find the passage impossible to be kept without a guide. Being within the bar, there are two channels, one running N.-easterly to Itchenor, the other northerly to Emsworth; in this latter, vessels may anchor in 4 or 5 fathoms; there are 9 fathoms in the entrance abreast of the watch-house. The Pole Sand is covered about 5 hours' flood with spring-tides.

**LANGSTON HARBOUR.**—At  $3\frac{1}{2}$  miles to the westward of the entrance to Chichester Harbour is a small channel, running between Hayling Island and Cumberland Fort Point; but the entrance is over a shallow flat called Langston Bar, which nearly dries at low water in several places, though within are 5 and 6 fathoms. This is called Langston Harbour; and the marks for sailing over the bar are the E. end of the large Chalk Pit on Portsdown Hill N.  $\frac{3}{4}$  W. and on with W. end of officers' houses at Cumberland Fort; when over the bar steer for the points between the East and West Winner Banks.

Hayling Knob, a small bank of 8 feet, lies with Hayling town N.N.E.,  $1\frac{1}{2}$  mile; Haslar Hospital open of Southsea Castle N.W. leads S. of it.

**Buoy.**—A conical buoy, painted in black-and-white horizontal bands, and marked L.F.W., is moored in  $1\frac{1}{2}$  fathom, just within the bar, and N.E.  $1\frac{1}{2}$  cable from the shoalest part of the bar, where the depth is only 6 feet at high water spring-tides; with Milton Church Spire three times its width open west of Engine Chimney N.W. by N., and South Hayling Church Spire E.  $\frac{3}{4}$  N.

## THE CHANNEL TO SPITHEAD.

### Description of the Shoals.

The general passage into **SPITHEAD** from the eastward, is between the Dean and Horse Sands on the N.-eastern side, and several shoals, which lie off the Isle of Wight, on the other.

The **HORSE, HORSE TAIL, and DEAN** is an extensive flat that shoals gradually, from 24 feet on its outer edge to the shore. Opposite Cumberland Fort the Horse tail runs out more than 3 miles, and these sands extend  $3\frac{1}{2}$  miles from the outer extremity, called the Dean Tail to the Sea Fort, (built on the Elbow of the Horse) in a N.-westerly direction; whence it bounds round to N., and at the distance of about 2 miles joins the shore near Southsea Castle.

The Spit is on the W. side of the channel or entrance to Portsmouth Harbour having one of Peacock's Refuge Beacon-buoys on its eastern extremity. The sand extends  $1\frac{1}{2}$  mile southward from Blockhouse Point, and  $1\frac{1}{2}$  mile eastward from Gilkicker Point. From Gilkicker Point the shore continues flat some distance off to Browndown Point, and thence to some distance up the E. side of Southampton Water. Near the end of the Spit sand is another of the Sea Forts built to protect the entrance to Portsmouth Harbour. This lies S.W. by W. a little over half a mile from Southsea Castle, and S.  $\frac{1}{2}$  E. from Blockhouse Fort, at the entrance of the harbour.

**Bullock Patch** of 28 feet, is rocky, and lies S.E. by E.  $\frac{3}{4}$  E.,  $3\frac{1}{2}$  miles from the Nab light-vessel, and N.W. by W.  $\frac{1}{2}$  W.  $3\frac{1}{2}$  miles from the Pullar buoy on the Cross Ledge. It is marked by a can buoy.

On the Isle of Wight side lies the **Princessa Shoal**, irregular and rocky, of about a mile in length from W.N.W. and E.S.E., and about half a mile broad, with a buoy at each end. This is not more than 20 feet at low water over the middle, and must be avoided by large ships, especially when a heavy sea is running.

The next to the Princessa is the **Bembridge Ledge**, which runs off from

Bembridge Point, marked by a buoy, and N.W. of this lie the Dickie Dawe Banks and Cole Rock.

The NAB is a small rock, seven-eighths of a mile E. of Bembridge Ledge, with 23 feet above it, and 5 and 6 fathoms close around it, marked by a can buoy.

The Outer Nab is a small patch of foul ground with 27 feet water, lying  $1\frac{1}{2}$  mile S.S.E.  $\frac{1}{2}$  E. from the buoy of the Nab; E. by N.  $\frac{3}{4}$  N. the same distance from the beacon buoy of the Princessa; and S.W.  $\frac{1}{2}$  S. from the Nab light-vessel,  $1\frac{1}{2}$  mile.

The New Grounds are several spots of gravel, sand, and broken shells, on the shoalest part of which are  $4\frac{1}{2}$  fathoms, lying N.E. of the Nab Rock, the northern part at eight-tenths of a mile distance; the S.W. part within a quarter of a mile of the Nab buoy. The Nab light-vessel lies E. by S., 1 mile from the northern part of the New Grounds. There are several other patches of similar depth to the N. by W. and S.S.E. of the buoy of the Nab; and the soundings about here are irregular; probably owing to the meeting of the tides round Dunnose.

The Long Rock has  $22\frac{1}{2}$  feet over it, and lies about a mile to the N.W. of the Nab, and about three-quarters of a mile N.  $\frac{1}{2}$  E. from Bembridge Ledge buoy, and in the direction of the Warner light-vessel. The marks to avoid it are, Dunnose open of Bembridge Point, and Porchester Castle open to the eastward of Southsea Castle.

The next is St. Helen's Patch, a small shoal of  $2\frac{3}{4}$  fathoms, nearly  $2\frac{1}{4}$  miles, N.N.W.  $\frac{1}{2}$  W., from the Nab Rock, and S.E.  $\frac{3}{4}$  E. from Nettlestone Point, distant  $1\frac{1}{2}$  mile.

The WARNER is nearly one-third of a mile in length from N.E. by N. to S.W. by S. and has 16 feet over it, and 12 fathoms on its E. side, at one-third of a cable's length from the light-vessel. On its W. side the soundings are regular, from 5 to  $3\frac{1}{2}$  fathoms.

No-Man's Land is next within the Warner. This is the N.E. part of the shoal ground that runs from Nettlestone Point towards the Horse; it has only  $7\frac{1}{2}$  feet on it just within the Sea Fort, that has lately been built upon the sand; it is steep-to, having 14 fathoms close on its northern edge.

Ryde Sand is a continuation of No-Man's Land. It runs from the shore from Nettlestone Point to Ryde, and still further westward within the Mother Bank.

The Sturbridge Bank is the next danger, and lies about  $1\frac{1}{2}$  mile N.-westward from No-Man's Land, and half a mile from Ryde Sand. This sand is nearly three-quarters of a mile long from N.W. to S.E., is very narrow, and has  $16\frac{1}{2}$  feet over its shoalest part, with a buoy on each end.

The MOTHER BANK is the next and last shoal here noticed. Its eastern extremity lies between the Sturbridge Bank and the island, having generally  $2\frac{1}{2}$  to  $2\frac{3}{4}$  fathoms on it, and runs westward to Wootton Point, until it joins the Peel Bank of  $1\frac{1}{2}$  to  $1\frac{1}{2}$  fathom from thence continues westward, and joins the shore at Old Castle or East Cowes Point.

#### Description of the Light-vessels, Buoys, &c., with their Marks.

The Bullock Patch buoy, black can, in 7 fathoms, lies about quarter of a mile to the southward of the patch. Asheydown tower in one with Bembridge Church spire W. by N.  $\frac{3}{4}$  N., clears it to the southward. The Nab light-vessel in her present position is a good mark for clearing it, by not bringing her to bear between N.W. by W. and W. by N.  $\frac{1}{2}$  N. until within 3 miles of her.

The following four buoys are all black :—

The OUTERMOST, or S.E. buoy of the Dean, called also the "Dean Tail" buoy, is a conical buoy, with staff and ball, in 5 fathoms, with Asheydown tower in line with St. Helen's Sea-mark, W.  $\frac{1}{2}$  N.; Nab light-vessel, S.S.W.  $\frac{1}{4}$  W.; Warner light-vessel, N.W. by W.  $\frac{1}{2}$  W., 3 miles; Dean Elbow, N.W.  $\frac{3}{4}$  W.,  $1\frac{1}{4}$  mile; and Southsea Castle, N.N.W.  $\frac{1}{2}$  W., 5 miles.

The **SECOND** is a can buoy called the **Dean Elbow**, and lies in 30 feet, with **St. Helen's Sea-mark**, just N. of the highest part of **Brading Down**, W.  $\frac{1}{2}$  S.; and the W. end of **Cumberland Fort** in line with public-house on **Portadown Hill**, N. by E.  $\frac{1}{2}$  E.

The **THIRD**, or **Dean**, is a can buoy, and lies in 36 feet, N.W.  $\frac{1}{4}$  W.,  $1\frac{1}{4}$  mile from the **Elbow buoy**, the bottom gravel; with the S.E. angle of **Cumberland Fort N.E.** by N.; **Southsea Castle N.** by W., and the **Horse Elbow buoy N.W.**  $\frac{1}{4}$  N.; three-quarters of a mile, nearly.

The **FOURTH**, or **Horse Elbow**, is a can buoy, and lies in 30 feet, gravelly bottom, with **Asheydown tower**, W. by S.  $\frac{1}{4}$  S.; the tower of **Southsea Castle N.**  $\frac{1}{4}$  W.; and **Horse Fort N.** by W., three-quarters of a mile.

**Horse Sand Fort Light**.—On the western side of the **Horse Sand** is a round **Sea Fort**, which shows a bright fixed light, elevated 34 feet. This fort bears from **Southsea Castle S.**  $\frac{1}{4}$  W. distant  $1\frac{1}{2}$  mile; from the **Spit Fort**, at entrance to **Portsmouth Harbour S.** by E.  $\frac{1}{2}$  E.; from the fort on **No-Man's Land E.** by N.  $\frac{3}{4}$  N.; from the **Warner light-vessel N.**  $\frac{1}{2}$  E.; and from the **Nab light-vessel N.N.W.**  $\frac{1}{4}$  W., distant 4 miles.

**ENTRANCE TO PORTSMOUTH HARBOUR**.—The **Horse Sand** stretches away from the **Horse Sea Fort**, to the northward, where it joins the beach at **Southsea Castle point**, where it skirts the shore to the pier at **Southsea Common**; above this and from the eastern point of **Portsmouth Harbour**, the shoal water makes a prong running out S. by E. from the shore of the town, to the length of 6 cables. The western edge of this shoal is about  $1\frac{1}{2}$  cable length from the shore at the pier at **Southsea**, and is called the **East Sand**, having least water over it, three-quarters to 1 fathom; with a deep gully of 6 or 7 fathoms between the bank and the shore. The western edge of this sand is marked by three black buoys to be left to starboard in entering **Portsmouth Harbour**.

The western side of the approach to **Portsmouth Harbour** is bounded by a considerable extent of shoal water, extending to the S-eastward from the shore between **Blockhouse Point** and **Gilkicker Point**  $1\frac{1}{2}$  mile, the end of which is marked by a **Refuge buoy**, and a quarter of a mile to the N.W. by W. of the buoy, there is a round **Sea Fort** built for the protection of the entrance to the harbour.

**SPIT FORT LIGHT**.—This fort is situate S.E.  $\frac{1}{2}$  S., 6 cables' length from **Southsea Castle**; N. by W.  $\frac{1}{2}$  W.,  $1\frac{1}{2}$  from the **Horse Sand Fort**, and S.  $\frac{1}{4}$  E.  $1\frac{1}{4}$  mile from **Blockhouse Fort**, and exhibits a fixed white light elevated 34 feet.

The whole of the above **Spit of Sand** is shallow water, and at low water the greatest depth is about  $2\frac{1}{2}$  fathoms. Towards the S.E. end there is a very shoal part called the **Ridge**, of only three-quarters of a fathom; this is little more than a cable's length to the E.S.E. of the **Sea Fort**. N.N.W., to the extent of  $3\frac{1}{2}$  cables from the fort, is a portion of the shoaler water called the **Spit Bank**, of three-quarters of a fathom; and N.N.E., 4 cables from the fort, is the **Elbow Spit** having only three-quarters of a fathom, and being within 2 cables of the shore of **Portsea**. These two shoal patches form the S.E. side of a **Swatchway** across the **Spit Sand**, of which two beacons on the **Southsea Shore** point out the direction, and when in one bear E. by N.  $\frac{1}{2}$  N. These two beacons are situate a little more than a cable's length apart, the outer one being coloured red and the inner one black, with a white stripe down the centre of the upper part.

From the **Elbow Spit**, the **Spit Sand** takes a N. by W.  $\frac{1}{2}$  W. direction to **Blockhouse Point**, and forms the S.-western side of the entrance to the harbour, and is marked out by five chequered black and white buoys; the width of the channel between the chequered buoys and the black buoys on the opposite or **East Sand** being scarcely a cable's length. From **Blockhouse Point**, a shallow part of the **Spit Sand** extends to the southward about seven-tenths of a mile, called the **Hamilton Bank**, which has but 1, three-quarters and a quarter fathom upon it, and forms the northern boundary of the **Swatchway**. More towards **Gilkicker Point**, off **Fort Monkton** is the **Harrow Bank** near to the shore and very shallow, and the **Monkton Bank** of three-quarters of a fathom further out from the coast, indeed all the coast from **Blockhouse Fort** to **Gilkicker Point** is shallow and should have a good

[E. CHANNEL.]

berth given to it. We have already noticed the black buoys on the eastern side of the entrance and the chequered buoys on the western side, while describing the sands, we now have to notice the buoys to the southward on the approach to the entrance.

**OUTER SPIT.**—This is a spur of shoal water running out in a S.  $\frac{1}{2}$  E. direction, 6 $\frac{1}{2}$  cables' length from the Sea Fort on the Spit Sand and on the western side of the approach. From the fort, in the above direction a cable or two, there are 2 $\frac{1}{2}$  fathoms on the Spit Bank, then dropping into 3 $\frac{1}{2}$ , 3 $\frac{1}{2}$  and 3 $\frac{1}{2}$  fathoms, to where a buoy is placed marking the southern part of the Outer Spit.

**Buoy.**—A black-and-white conical buoy, marked "Outer Spit," has been placed on the S.E. part of the bank, extending off the Spit Sand, in 3 $\frac{1}{2}$  fathoms at low water with Spit bell-buoy N. by E.  $\frac{1}{2}$  E., 5 $\frac{1}{2}$  cables' length; Gilkicker Point N.W.  $\frac{1}{2}$  W.; and Horse Fort S.S.E.  $\frac{1}{2}$  E., 1 mile; the eastern side of No-Man's Land fort in line with the Yarborough Monument, on the Isle of Wight.

**THE SPIT SAND Refuge Buoy.**—This is a large beacon buoy, chequered black-and-white, and is moored in 22 feet, on a fine sandy bottom, near the S.E. spit of the sand, marking the Outer Bar of Portsmouth Harbour. From this buoy the No. 1 chequered buoy of the Elbow Spit bears N.  $\frac{1}{2}$  W. distant half a mile; Southsea Castle, N.E. by N. on the line where the light of the castle changes from red to green; the Horse Sand Fort S. by E., distant 1 $\frac{1}{2}$  mile nearly; No-Man's Land Fort S.S.W.  $\frac{1}{2}$  W. distant 1 $\frac{1}{2}$  mile, and Ryde Pier end W. by S.  $\frac{1}{2}$  S. a little over 3 miles.

**THE BOYNE Buoy.**—The buoy over the old wreck of the "Boyne" is a green conical buoy, on the eastern side of the outer bar to the S.-eastward of the Spit Sand refuge buoy, and is laid in about 30 feet water with Southsea Castle N.  $\frac{1}{2}$  E., and the Horse Fort S.  $\frac{1}{2}$  E., a little more than a mile.

**KNOLL, Buoy.**—Almost midway between the Horse Sand and the Sand Spit a knoll has grown up, composed of loose shingle, and having but 18 feet upon it at low water, a black buoy has been placed on the western edge thereof in about 19 feet, with Southsea Castle light-house bearing N. by E.  $\frac{1}{2}$  E. rather more than half a mile; and the Spit beacon buoy N.W. by W.  $\frac{1}{2}$  W., one-sixth of a mile.

A similar knoll of 22 feet has also been found S.W.  $\frac{1}{2}$  S., 1 $\frac{1}{2}$  cable's length from the above in the line with the present leading mark into Portsmouth Harbour, viz.:—Fitzclarence Monument in line with the outer Swatchway red beacon, bearing N.  $\frac{1}{2}$  E.

Seven other buoys mark the entrance to Portsmouth, which will be noticed in the directions for sailing into the harbour.

**Light on Southsea Castle.**—This light is placed to assist vessels to make for the harbour, especially in stormy weather; it is elevated 51 feet above the level of high water, visible 9 miles; it appears bright red in the channel between the Spit Refuge buoy and the Horse Fort, or between the bearings of N. by E. and N.E. by N., but green to the westward of the Spit buoy or between N.E. by N. and E.  $\frac{1}{2}$  N. To the eastward of the Horse Fort it is invisible. Coming from the eastward, it will first show a faint red light, bearing N. by E.; this bearing will lead 3 cables west of the Horse Fort, and nearly strike the Boyne buoy.

A little more than half a mile N.N.W. of Southsea Castle is the Clarence Esplanade Pier at Southsea, at the ends of which two fixed red lights are exhibited to facilitate the approach of steam vessels at night time; a central white light is also shown whilst steamers are plying. A large lamp of four burners is lighted immediately within the pier. There are several small lights exhibited in Portsmouth Harbour, but only useful inside.

The preceding buoys and lights of the Dean, Horse and Spit Sands must always be left on the starboard hand in proceeding towards Spithead. On the port side are the shoals which lie off the Isle of Wight, as follows:—

**Buoys.**—**The Princessa Shoal.**—This shoal is marked by two buoys. The S.E. is a conical black-and-white chequered buoy, with staff and cage in 29 feet at low water with Red Clay Cliff, in Sandown Bay, just open of Culver Cliff, W. by N.  $\frac{1}{2}$  N.; Dunrose W. by S.  $\frac{1}{2}$  S., distant 7 miles; N.W. Princessa buoy N.W.  $\frac{1}{2}$  W.,  $\frac{1}{2}$  of a



mile Bembridge Ledge buoy N. by W.  $\frac{1}{4}$  W.,  $1\frac{1}{10}$  mile; Warner light-vessel north 4 miles; and Nab light-vessel N.E.  $\frac{3}{4}$  E.,  $2\frac{3}{10}$  miles.

The N.W. Princessa buoy is a black-and-white can-buoy, striped vertically, in 24 feet, oazy bottom, with the S.E. buoy S.E.  $\frac{1}{4}$  E.,  $\frac{9}{10}$  of a mile; eastern land of Bembridge N. by W.  $\frac{1}{4}$  W., and Culver Cliff W. by N.,  $1\frac{1}{2}$  mile. Yarborough Monument, on Culver Down, leads over the middle of the shoal in  $3\frac{1}{4}$  and 4 fathoms.

**LEADING MARKS.**—The leading marks to clear the Princessa Shoal are, to the northward:—Bembridge Church in line with Foreland Farm N.W. To the eastward in 4 fathoms, the Horse Fort its breadth open westward of St. Jude's Church Spire N.  $\frac{1}{4}$  E.; and to the southward, the Shoulder of Appuldercomb Hill, in line with Shanklin Railway Station W.  $\frac{1}{2}$  N.

Bembridge Ledge is a black-and-white chequered can buoy, in 24 feet, a mile N. by E.  $\frac{1}{4}$  E. from the N.W. buoy of the Princessa; Nab light-vessel E.  $\frac{1}{2}$  N.; Warner light-vessel N.  $\frac{1}{2}$  E., and Bembridge Sea Fort N.N.W.  $\frac{1}{2}$  W., distant  $1\frac{1}{2}$  mile. St. Helen's Church open 2 degrees north of Sea Mark (south of St. Helen's Point) N.W.  $\frac{1}{4}$  W. leads to the northward of the Bembridge Ledge.

Nab Light-Vessel is moored in  $5\frac{1}{2}$  fathoms, to the E. of the New Grounds, with the word "Nab" painted on her sides, and lies with Portsmouth Church tower in line with Southsea Castle light, N. by W.  $\frac{1}{2}$  W.; Kickergill tower on with the E. end of Monckton fort N.N.W.  $\frac{1}{2}$  W.; N. tower of Osborne just open of the easternmost trees near Ryde N.W.  $\frac{3}{4}$  W.; Deal Tail buoy, N.E. by N., distant  $1\frac{1}{10}$  of a mile; Horse Fort N.N.W.  $\frac{1}{2}$  W., 4 miles; Warner light-vessel N.W.  $\frac{1}{4}$  N.  $3\frac{2}{10}$  miles; Bembridge buoy W.  $\frac{1}{4}$  S.  $2\frac{1}{10}$  miles; S.E. Princessa buoy S.W.  $\frac{1}{2}$  W.  $2\frac{1}{10}$  miles. Ryde Church, open of Nettlestone Point, N.W.  $\frac{3}{4}$  W. is a good leading mark up to the light-vessel, and this mark also clears to the southward of the Bullock Patch.

From this light-vessel two distinct fixed lights are shown in separate lanterns, suspended from two masts, 54 feet asunder, and at different heights, the one on the mainmast 38 feet, the other 28 feet above the water, and visible 8 and 6 miles off, by which this light may be readily distinguished from the Owers light, and other lights in the vicinity. In the day-time a red ball is hoisted at each mast-head, and a gong is sounded in foggy weather, and a gun fired if a vessel is seen standing into danger.

The Nab buoy is a black-and-white can, in rings, and lies about  $1\frac{1}{2}$  mile W. by S. of the Nab light-vessel, with the Princessa chequered buoy S. by W.  $\frac{3}{4}$  W.; Bembridge Ledge buoy W.  $\frac{1}{4}$  S.,  $\frac{1}{10}$  of a mile, and Warner light-vessel N.  $\frac{3}{4}$  W.

**The Warner Light-Vessel.**—This vessel is moored in 13 fathoms, on the W. side of the channel, near the Warner Shoal, showing a bright flash every minute, and lies with the outer end of Ryde pier, between the towers of Osborne N.W. by W.  $\frac{1}{4}$  W. No-Man's Land Fort, N.W.  $\frac{1}{4}$  N.; Nab light-vessel, S.E.  $\frac{1}{2}$  S.  $3\frac{2}{10}$  miles; one ball at mast-head.

**No-Man's Land Light.**—On the N.E. projection of this sand, a Sea Fort has been erected, similar to those on the Horse and Spit Sand, and from which a red fixed light is exhibited, 38 feet in height. From this fort the Sea Fort on the Horse bears E. by N.  $\frac{1}{2}$  N., distant a little over a mile, and the fort on the Spit Sand N. by E.  $\frac{3}{4}$  E., distant  $1\frac{1}{10}$  mile.

**Ryde Sand.**—On the eastern elbow is a buoy, chequered black-and-white, called the Sand Head Buoy. This buoy lies with the end of Ryde Pier, bearing W. by N.; Southsea Castle, N.E. by E.; and No-man's Land Fort S.E. by E.  $\frac{1}{4}$  E., distant  $1\frac{1}{10}$  mile. At Ryde there is a fixed white light on the end of the pier, elevated 21 feet, visible 6 or 7 miles.\*

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\* **RYDE PIER MOORINGS.**—The Ryde Pier Company have laid down new and additional moorings to the eastward of their pier, with W. fasts, for the use of vessels discharging on the Ryde shore; vessels will be charged 1d. per ton, but owners availing themselves of the Company's moorings, are not relieved thereby from liability for any damage which may be occasioned to the pier by their vessels, unless masters, or other persons in charge, take proper and seamanlike precaution for securing their vessels, in addition to the use of the Company's moorings.

F. and C. makes at 10h., and runs 6 hours W. by S.  $\frac{1}{2}$  S., and the eastern stream begins at 4h. and sets E.N.E. At the S.E. buoy it is half an hour later; the stream setting W.  $\frac{3}{4}$  S., gradually running more southerly, till at last it runs S.W. by S. The eastern stream runs E. by N. the whole tide.

At the Nab Shoal the tidal streams are rotary, which is probably caused by the Spithead tide meeting the tide round Dunnose to the westward of the light-vessel; for instance, at the first hour's flood by the shore it sets East; second and third hours E.N.E.; fourth, N.E.; fifth, N.E. by N.; sixth, North; seventh, N.N.W. to N.W., and the last drain of the flood N.W. by W. The first hour's ebb sets W. by N.; second, W. by S. to W.S.W.; third, S.W. by W. to S.W.; fourth, S.W.  $\frac{1}{2}$  S.; the first part of the fifth hour S.S.W., gradually trending to the southward until low water by the shore, when it sets S.E. There are only a few minutes slack. At full and change, the eastern stream makes at 8h. 30m., and the western stream at 12h. 15m.

At the Warner, at full and change, the eastern stream makes at 2h., and runs  $7\frac{1}{2}$  hours about S.S.E.; and the western stream 9h. 30m., and runs nearly  $4\frac{1}{2}$  hours N.N.W.

Near the Horse and Elbow, the tide must be strictly attended to, for in many cases it sets directly over that shoal. The eastern stream makes at 2h.,  $2\frac{1}{2}$  hours after the tide on the shore, and runs to the S.E.  $7\frac{1}{2}$  hours; the western stream makes at 9h. 15m.,  $4\frac{1}{2}$  hours after low water on the shore, and runs nearly 5 hours to the N.W.

At the Dean Elbow, at full and change, the eastern stream, which sets over that shoal, makes at 2h.; runs to the S.E. for 2 hours, and then sets East for the remainder of the tide,  $5\frac{1}{2}$  hours; the western stream makes at 9h. 45m., and runs W.N.W.,  $4\frac{1}{2}$  hours.

At Spithead, full and change, the eastern stream makes about 2 o'clock,  $2\frac{1}{2}$  hours after high water in the harbour, and runs 7h. S.E. by S.; and the western stream about 9 o'clock,  $2\frac{1}{2}$  hours before high water in the harbour, and runs 5 hours N.W. by N.

In Portsmouth Harbour the flowing continues about 7 hours, and ebbing 5 hours; a narrow stream runs in 15 or 20 minutes after high water at the Dockyard. At high water the slack water at springs continues for 8 minutes, and neaps 16 minutes.

At Portsmouth Dockyard it is high water at 11h. 41m.; spring-tides rise  $12\frac{1}{2}$  feet; neaps 10 feet.

**TIME BALL.**—A time ball is hoisted half-way up the staff or semaphore, in Portsmouth Dockyard, at 5 minutes before, and close up at 2 minutes before 1 P.M. every day, and dropped at the instant of 1 P.M., Greenwich Mean Time. The semaphore is in lat.  $50^{\circ} 48' N.$ , and long.  $1^{\circ} 6' 15''$ , or 4 minutes 25 seconds W. of Greenwich.

**PILOTAGE.**—PORTSMOUTH AND COWES DISTRICT.—No master of a vessel is compelled to take a Portsmouth or Cowes pilot until within 5 miles of Bembridge Ledge, or 3 miles of Dunnose, St. Catherine's or the Needles; or until at St. Helen's if he has a London or Cinque-Port pilot on board; but if he does take a pilot between the Owers and Peveral Point, it must be one of the district.

## FROM SPITHEAD THROUGH THE ISLE OF WIGHT CHANNEL AND NEEDLES, TO POOLE, &c.

**GILKICKER POINT** lies nearly 2 miles W. by N.  $\frac{1}{2}$  N. from Southsea Castle, and 7 miles N.W. from Gilkicker Point is Calshot Castle, at the western side of the entrance to Southampton Water, and distant  $5\frac{1}{2}$  miles from Southampton. From Calshot Castle the coast bends S.W. by W. to Stansore Point, which is distant  $2\frac{1}{2}$  miles; and thence to Hurst Castle, the bearing and distance are W.  $\frac{1}{2}$  S., 9 miles. On the Isle of Wight side, Old Castle, or East Cowes, is the first point, and bears

from Gilkicker Point W.N.W.  $\frac{1}{2}$  W., distant  $5\frac{1}{2}$  miles, from thence to Egypt Point, the bearing and distance are N.W. by W.  $\frac{3}{4}$  W.,  $1\frac{1}{2}$  mile, having the entrance to Medina River between. The distance from Egypt Point to Stansore Point is about  $1\frac{1}{2}$  mile N. by W.  $\frac{3}{4}$  W. This is the eastern extremity of the SOLENT, the name of that part of the channel which extends from thence to Hurst. From Egypt Point to Sconce Point the bearing and distance are W.  $\frac{1}{4}$  S.,  $8\frac{1}{2}$  miles, and from the latter to Hurst Castle, W.N.W., a little more than a mile.

STOKES BAY lies to the westward of Gilkicker Point, and is a place much frequented by merchant ships; here you may anchor in from 4 to 9 fathoms, from half a mile to 2 miles distant from Gilkicker Point, on excellent holding ground.

At Stokes Bay a pier, 600 feet long and 60 feet broad, runs out from the shore about half a mile northward of Gilkicker Point. The pier-head is diamond shaped, 240 feet long and 90 feet broad, and there are 6 feet water alongside it at low water springs. This pier, as also that of Southsea and Ryde, are in conjunction with the railroads to London.

Lights.—On the end of the pier two red lights are shown, one on the east and the other on the west end; these two lights are shown all night, and, in addition, a central red light is shown when the steamer is expected.

Measured Mile.—On the shore of the bay beacons have been erected to mark the transit distance in the trial of steamers. The easternmost of the beacons is just in the rear of Fort Monkton; the westernmost about half a mile to the northward of the pier. In addition to the beacons two white buoys, each with a red staff and globe, have been moored to show the best direction of course, which will be from the easternmost N.  $44^{\circ}$  W. The eastern buoy lies in 13 fathoms water at half a mile southward of Gilkicker Point. The western buoy lies in 10 fathoms, at three-quarters of a mile southward of Brown Down Batteries, on the shore of Stokes Bay. These buoys lie in a N.W. and S.E. direction, and are placed a cable's length from either end of the Measured Mile. As the course between the buoys is not more than  $1\frac{1}{2}$  cable outside a bank in Stokes Bay, on which there are only  $3\frac{1}{2}$  and 4 fathoms at low water springs, vessels of heavy draught should not turn inwards or towards the shore of the bay.

Torpedo Ground Buoys.—The following mark buoys have been placed in the vicinity of No-Man's Land Bank and off Gilkicker Point, at Spithead, for the purpose of indicating the ground used for torpedo experiments:—

Three buoys, painted green and white in horizontal bands, near Gilkicker Point:—

1. WEST BUOY, in  $11\frac{1}{2}$  fathoms. The inner west beacon of the measured mile in line with the coastguard flagstaff at Stokes Bay, N. by W. and the whole of Lumps Fort in sight south of Southsea Castle E.  $\frac{1}{2}$  S.

2. MIDDLE BUOY, a conical buoy in 8 fathoms. The flagstaff on the west end of Fort Monkton in line with the inner east beacon of the measured mile N.  $\frac{1}{4}$  W., and the west buoy W. by N.  $\frac{3}{4}$  N.

3. EAST BUOY in 3 fathoms. North corner of the old gun wharf seen south of Blockhouse fort N.E.  $\frac{1}{4}$  N., Lumps Fort just showing to the southward of Southsea Castle E.  $\frac{3}{4}$  S., the middle buoy W.S.W., and the east end of the stone wall running from the east side of Fort Monkton N.  $\frac{3}{4}$  W.

All these buoys are marked "Torpedo Ground," in black and white letters.

CAUTION.—Mariners are recommended not to pass within the space marked by these buoys, for although no danger is to be apprehended from explosions—as the buoys used in torpedo experiments are not loaded—yet inconvenience would arise from fouling the electric cables attached thereto, and boats and lightly built vessels striking violently against either the torpedo buoys or current closers, which would sometimes be under water, might receive damage in consequence.

#### Description of the Shoals.

WITHIN THE ISLE OF WIGHT to the westward of Spithead there are several shoals which lie in the way of shipping. Of these the first are the RYDE, MOTHER, and PEEL BANKS, the former drying at low water along the shores of the lake

of Wight. The edge of the Mother and Peel Banks extends S.E. by E., 4 miles from Old Castle Point, and terminates in two points or spits; the Inner Spit running in between the Sturbridge and Ryde Sand; the Outer Spit terminating at about a quarter of a mile W.  $\frac{1}{2}$  N. from the W. buoy of the Sturbridge. On this part there are 4 fathoms. All along its northern edge to where it joins the shore, are from  $2\frac{1}{2}$  to 2 and 1 fathom; the Peel buoy lies on this edge.

To the westward of Stokes Bay, between Gilkicker Point and Old Castle Point, lies the Ryde Middle Bank, a little more than 2 miles in length, N.W. by W. and S.E. by E., and about a quarter of a mile wide; it has two fathoms on its shoalest part, and is marked by two buoys on the east end, and one on the western, as will be described. There are 5 and 6 fathoms near to both sides of it.

The Bramble lies at the entrance to Southampton Water, and has from three-quarters to  $2\frac{1}{2}$  fathoms over it; the least depth is near the W. end, where there is a patch which dries. Along its south edge, from the depth of 3 fathoms, it suddenly deepens to 6, 7, and 8 fathoms; four buoys are laid on its edges.

The Thorn is a small narrow shoal of  $2\frac{1}{2}$  fathoms, to the N.-westward of the Bramble, and having a passage on each side of it into Southampton Water. To the northward of the Thorn is Calshot Spit, which runs out to a considerable distance from shore, and extends from Calshot Castle to Stansore Point. Two buoys are placed on the Thorn, and a black refuge buoy on the Spit.

Lepe Middle is a long narrow shoal of 10 to 12 feet on its shoalest part, and lies outside the edge of the flat that runs off Needsoar Point, about a mile; it has a buoy marking its eastern ends. The leading mark to clear this shoal to the southward in 4 fathoms is the Coast-guard Station at Hill Head, rather nearer Nelson's Monument than the large Chalk-pit on Portsdown Hill, E.  $\frac{1}{2}$  N.

**Solent Banks.**—These consist of three patches, in mid-channel, extending nearly a mile in an E. and W. direction, the two easternmost patches have  $4\frac{1}{2}$  to  $4\frac{3}{4}$  fathoms on them, but on the western patch is a spot of only 22 feet at low water. The mark for this spot is the western edge of Hill Trees, in one with Yarmouth Sand House, W. by S.  $\frac{1}{2}$  S., and the Coast-guard shed at Fish-house Point, in line with the large chalk-pit on the distant downs S. by E.  $\frac{1}{2}$  E. The low light-house at Hurst bearing W. will lead to the southward.

In the Solent, to the westward of West Cowes, off Gurnet and Hampstead Points, are ledges of rocks extending from the shore nearly a quarter of a mile out. Besides these there are the Salt Mead Ledges, and Newton Gravel Banks. The eastern part of these shoals commences 1 mile to the westward of Egypt Point, abreast of Gurnet Coast-guard station, and continues along shore 4 miles to Hampstead Ledge, extending at Salt Mead Ledges about midway, to half a mile off shore, with only 9 to 12 feet in some parts near the outer edge. Near the red buoy off Gurnet Ledge, and the red buoy on Hampstead Ledge, the island should not be approached within half a mile. At the Salt Mead Ledges not within three-quarters of a mile.

On the opposite shore, from Stansore Point to the westward is a flat, which runs a considerable way over the channel from the main towards the island, and continues nearly in a line to Hurst, and dries at half-tide. About three-quarters of a mile to the westward of Stansore Point is a passage which leads into Beaulieu River: it is narrow and winding, having at the entrance only 2 feet, but further in are 3 fathoms. Two red beacons on the shore three-quarters of a mile to the westward of Stansore Point mark the entrance, and when in one bearing N. by E.  $\frac{1}{2}$  E. lead over the bar in the deepest water. Inside the channel is marked by perches.

**Lymington River** is 6 miles to the westward of the bar of Beaulieu River, and flows through a mud bank, or a flat. The western side of the entrance is marked by a red-and-white chequered can buoy, in 9 feet on a spit; and by a large ball beacon, called Jack-in-the-Basket. To enter the river keep Jack-in-the-Basket in line with Lymington Church N.N.W., passing the chequered buoy pretty close, and also the perches, leaving them all on the port hand. Abreast of the town there are 14 feet at high water springs, and 11 at neaps.

## Description of the Buoys, Lights, &amp;c., with their marks.

**Quarantine Ground.**—About a mile to the N.W. of Ryde Pier, and about the same distance from shore, is the outer boundary of the Quarantine Station, which is marked out by the following buoys on the Mother Bank, Spithead :—

**QUARANTINE BUOY, No. 1.**—A yellow can buoy is moored in 5 fathoms on the northern edge of the Mother Bank spit, with the south side of Fort Monkton touching the north side of the round tower at Point, Portsmouth, E. by N.  $\frac{3}{4}$  N. northerly. Nelson's monument about half-way between the beacons placed for marking the west end of the measured mile in Stokes Bay, N.E. by N. Centre of Ryde pier-head, S.  $\frac{1}{4}$  W. southerly.

**QUARANTINE BUOY, No. 2.**—A yellow can buoy is moored in 5 fathoms on the north-east projection of the Mother Bank, with Southsea Castle light-house in line with the N.W. corner of Eastney water tower E.  $\frac{1}{4}$  S. Asheydown monument in line with the centre of a roof of a house among trees S. by E.  $\frac{3}{4}$  E. Centre of Ryde Pier. S.S.E.  $\frac{1}{2}$  E.

The red buoy marking the quarantine burial place has not been moved. All other buoys formerly on the Mother Bank have been removed.

The deep water is near the southern Lazaretto, where there are 4 and 5 fathoms at low water. Merchant vessels in pratique generally anchor between the Outer and Inner Spits of the Mother Bank and Sturbridge, in 5 to 11 fathoms water over clean ground, sheltered from southerly winds, with Ryde bearing from S.W. to S.S.W.

**The Ryde Middle N.E. buoy.**—This is a red buoy with staff and globe, moored about 3 cables' length to the N.E. by E. of the East Middle buoy, in about  $7\frac{1}{2}$  fathoms with Southsea Castle light-house just open north of Gilkicker Fort, E. by S.  $\frac{1}{4}$  S. Coastguard flagstaff on Lee Point, N.N.E.  $\frac{1}{4}$  E. This buoy is placed principally as a guide in turning a long vessel after running the Measured Mile in Stokes Bay, and it also clears the northern edge of the Ryde Middle.

The Peel can buoy is red, and lies close to the N. edge of the Mother Bank in 20 feet  $2\frac{3}{4}$  miles from the W. buoy of the Sturbridge. Its marks are the E. buoy of the Middle E.N.E.; Asheydown Tower S.  $\frac{1}{4}$  W.; and Portsmouth Church Tower in one with the S. part of Haslar Chapel E.  $\frac{1}{4}$  N.

**NOTE.**—The Peel buoy, the quarantine buoys, and West Sturbridge buoy are nearly in a line.

The Ryde Middle E. buoy is conical, red-and-white chequered, and lies in 7 fathoms, with coastguard flagstaff westward of Mansion House Hotel, touching the south tangent of Southsea Castle E. by S. southerly; the semaphore in Portsmouth Dockyard, in line with 2nd chimney from the eastward of the coastguard houses in Stokes Bay E.  $\frac{3}{4}$  N.; Wootton Rocks beacon, Isle of Wight S. by W.  $\frac{3}{4}$  W.

The Ryde Middle W. buoy is a can buoy, marked in red-and-white horizontal rings, in 29 feet, with a large brick house at W. Cowes, on with the rope-house on E. Cowes Point, W. by S.  $\frac{1}{4}$  S., and Asheydown Tower S.  $\frac{1}{4}$  E.

**Yacht Buoy.**—Between the Peel buoy and Old Castle Point, a black cask buoy is moored for the service of the Yacht Squadron, but it marks no particular danger, and merely the edge of the Peel Bank as it recedes from the Peel buoy towards the land at Old Castle Point.

**Old Castle Point.**—Off Old Castle Point at less than quarter of a mile distant there is moored a red can buoy, with the Sea-bathing house at the point, bearing S.W.; and the Ryde Middle W. buoy E. by N.

**Prince Consort.**—Directly opposite the entrance of the River Medina, at a quarter of a mile distant, there is a small shoal of  $3\frac{1}{2}$  fathoms, marked by a red can buoy. This buoy bears N.W. by W. from the buoy off Old Castle Point; and nearly south from the W. Bramble buoy, distant a little over three-quarters of a mile.

The Bramble E. buoy is a conical buoy, striped vertically red-and-white, in 19 feet water, with W. Cowes Mill open west of the Bathing-house bearing W. by S.  $\frac{1}{4}$  S.; Hill Head Buoy in line with Calshot Castle N.W. by N., distant  $1\frac{1}{2}$  miles, W. [E. CHANNEL.]

Bramble buoy W. by N.  $\frac{3}{4}$  N.,  $2\frac{5}{16}$  miles; W. Middle buoy W. by S.  $\frac{1}{4}$  S.  $1\frac{1}{16}$  miles, and E. Middle Buoy S. by E.  $\frac{3}{4}$  E.,  $1\frac{1}{4}$  mile, in 25 feet, at the distance of three-quarters of a mile N.N.E.  $\frac{1}{2}$  E. from the W. buoy of the Middle, with the W. side of Hamble Church tower, on with Hook summer-house, bearing N.  $\frac{1}{4}$  W.; and the S. side of Haslar Hospital water-engine S.E. by E.  $\frac{3}{4}$  E.

The Bramble N.E. buoy, marked "Hill Head," is a red conical buoy in 17 feet, with Nelson's Monument E. by N.  $\frac{1}{4}$  N.; and the east end of Hamble Church N.  $\frac{1}{4}$  W.

The Bramble W. buoy is a conical buoy chequered red and white, with staff and cage, in  $4\frac{1}{2}$  fathoms, with Calshot Castle N. by E., and Gilkicker Point S.E. by E.  $\frac{1}{2}$  E.

The Bramble N.W. buoy is a red can buoy in  $4\frac{1}{2}$  fathoms, with the Windmill on W. Cowes S.S.W.; and Hamble Church tower on with Calshot Castle N. by E., nearly.

Thorn Knoll buoy is a can buoy, marked in red and white rings, in  $4\frac{1}{2}$  fathoms on the W. edge of the Knoll, with two remarkable trees on Calshot beach touching the N. end of Netley Hospital; N.W. Bramble buoy S.E.  $\frac{1}{2}$  S., distant 3 cables; and Calshot spit buoy N.E. by E., five-sixths of a mile.

North Thorn.—A red can buoy, marked "North Thorn," has been laid on the north edge of the Thorn Knoll, in  $3\frac{1}{2}$  fathoms, with Nelson's Monument E. by N.; Calshot light-vessel N.E. by E.  $\frac{1}{2}$  E., distant a mile; and Thorn Knoll buoy W.S.W., half a mile distant.

Calshot-Spit buoy lies off the S.E. extremity of the spit. This buoy is a black refuge buoy, in about 9 feet at low water, with the spit light-vessel E. by N.; the N.W. buoy of the Bramble S.W. by S.; and Calshot Castle N.  $\frac{1}{4}$  W., 1 mile.

Castle buoy is black, on the edge of the sand, with Calshot Castle Point bearing N.N.W.  $\frac{3}{4}$  W., nearly half a mile; and the light-vessel S.E. three-quarters of a mile.

Light-vessel OFF CALSHOT SPIT.—This light-vessel is moored a little more than half a mile from the Spit, and  $1\frac{1}{2}$  mile S.E.  $\frac{1}{2}$  S. from Calshot Castle, and exhibits a revolving light every minute, and is moored in  $3\frac{1}{2}$  fathoms with Gilkicker Point S.E. and Calshot Castle N.W.  $\frac{1}{2}$  N. The deepest water is to the westward of this vessel, between her and the spit.

SOUTHAMPTON WATER.—SHOALS.—Information has been received that on the shoal ground in the fairway of the entrance to Southampton Water, nearly midway between Calshot Castle and Calshot light-vessel, over which a depth of 26 feet was considered to exist; a small patch of 22 feet at low water spring tides has been found. The shoal is composed of gravel and mud. From it Calshot Castle Coastguard flagstaff bears N.  $41^{\circ} 35'$  W., Luttrell tower S.  $82^{\circ} 55'$  W:

Also, a shoal with 18 feet on it at low water ordinary spring tides exists near the moorings of the Coastguard ship, Southampton Water. From the shoal, Netley Hospital dome bears E. by S.  $\frac{1}{2}$  S., distant eight-tenths of a mile; Netley Castle flagstaff, N.E. by N., distant seven-tenths of a mile; Hythe Church N.W. by W.  $\frac{3}{4}$  W., distant  $1\frac{1}{16}$  mile; Coastguard ships mooring buoy, S.E. by E., distant 217 yards.

The four next following buoys are laid down in the eastern portion of the Solent Channel, three of which are on the N. shore of the Isle of Wight, viz., one on the Gurnet Ledge, one on the Salt Mead Ledge, and one on Hampsted Ledge; the fourth lies on the opposite side of the channel, on the Lepe Middle,  $1\frac{1}{2}$  mile N.N.W.  $\frac{1}{2}$  W. from the Gurnet.

The Gurnet buoy is a red can buoy, in  $3\frac{1}{2}$  fathoms, 2 cables off shore,  $1\frac{1}{2}$  mile W.  $\frac{1}{2}$  S. of Egypt Point.

Salt Mead Ledge buoy is a red can buoy, in 5 fathoms, on the N.E. end of the ledge, with Egypt Point E.  $\frac{3}{4}$  N.; Hampsted Ledge buoy W.  $\frac{1}{4}$  N., 2 miles; and Hurst high light, W.  $\frac{1}{2}$  N.

Hampsted Ledge buoy is a red can buoy, in 5 fathoms, on the N.E. end of the ledge, with N. Close farm-house in line with N. beacon at entrance of Newtown Pier, S.E. by E.  $\frac{3}{4}$  E.; Egypt Point E.  $\frac{3}{4}$  N.; and Hurst high light-house, W.  $\frac{1}{4}$  N.

**Lepe Middle Buoy** is a can buoy, striped vertically red-and-white, in  $3\frac{1}{2}$  fathoms, with Nelson's Monument on with Hill Head; Thorn Knoll buoy E. by N.; and Hampsted Ledge buoy W. by S.  $\frac{1}{2}$  S.

**Lymington Spit buoy** is a can buoy, chequered red and white, in 9 feet, on the W. side of the entrance to Lymington Creek, N. side of Solent.

**Black Rock Ledge buoy**, westward of Yarmouth, is a red can buoy, in 10 fathoms, a little to the northward of the Rock, with Yarmouth Church S.E. by S.; Hurst high light W. by N.  $\frac{1}{2}$  N.; and Hampsted Ledge buoy E.

**Yarmouth Lights**.—Two fixed bright lights, 30 yards apart. The outer light, green, from a lamp-post on the quay, near the castle wall; the inner, white, from the corner of a house, and when in one S.S.W., lead into the harbour in 14 feet at high water springs.

Yarmouth is a convenient little port for small vessels, with a good quay, and sheltered by a substantial breakwater. A wooden pier is in the course of construction and nearly completed, from the end of which a temporary white light is exhibited.

The pier extends from the end of Bank-street in a N. by E.  $\frac{1}{4}$  E. direction 712 feet; it is built of wood and painted white. On the end of the pier is the signal flagstaff.

## DIRECTIONS FROM SPITHEAD TO HURST AND UP TO SOUTHAMPTON.

Sailing northward of the Ryde Middle, from Spithead, a N.W.  $\frac{1}{4}$  W. course from the buoy of the Horse Elbow, will carry you about  $\frac{1}{2}$  a mile to the northward of the N.E. buoy of the Middle; keep on this track until the tower of Southsea Castle comes open to the northward of Monkton Fort, bearing E.S.E. This mark will lead between the Middle and Bramble, in from 8 to 10 fathoms, to a fair berth abreast of the W. Bramble chequered buoy, and off W. Cowes, in about 11 fathoms at S.W.; thence W.  $\frac{1}{2}$  S., 6 miles to Hampsted Ledge buoy to the southward of the Solent Banks, from which position W.  $\frac{1}{2}$  S.,  $4\frac{1}{2}$  miles will bring you up with Hurst lights, the high light bearing N.N.W., distant about one-third of a mile. In this track you will be nearer to the island than the main-shore, and will skirt Sconce Point to the westward of Yarmouth, but which is steep-to. If near to high-water, or with a rising tide, and the vessel not drawing over 20 feet, a W.  $\frac{1}{4}$  S. course may be made the whole distance from off Cowes.

Sailing southward of the middle from Spithead, the leading-mark is Egypt Point, just opening north of Old Castle Point W.N.W., and when the Peel buoy bears S.S.E.  $\frac{1}{2}$  E., distant half a mile, steer N.W.  $\frac{1}{4}$  W., in order to give Old Castle Point, a good berth, which, having rounded, you may come up more to the westward, leaving the Prince Consort Shoal to the port, and when Egypt Point or W. Cowes Church bears S.W. by S. proceed towards Hurst Point as before directed, in dark weather, should Egypt and Old Castle Points not be distinguishable from Spit head steer W.N.W. from the anchorage, taking care to keep Southsea Castle well open of Gilkicker Point; this will clear the S.E. end of Ryde Middle, until a former mark can be seen and brought on.

Working to windward, stand towards the Sturbridge in 8 fathoms, and towards Gilkicker Point to the same depth; towards the Mother Bank into 7 fathoms, and into Stokes Bay to 7 or 6 fathoms. Between the Middle and Mother Banks you may stand into 7 fathoms on either side; and also into the same depth towards the N. side of the Middle and towards the shore, taking care to come no nearer the Ryde Middle than to have Gilkicker Point E.S.E., or Southsea Castle well open to the north of Monkton Fort. Stand no nearer to the Bramble than 9 or 8 fathoms, nor to Old Castle and Egypt Points, than 8 or 7 fathoms.

Between Egypt Point and Yarmouth, you may stand towards the island into 8 fathoms, taking care to avoid the before-mentioned ledges of rocks off Egypt.

Gurnet, Salt Mead, and Hampsted Points; and towards the main in 7 to 6 fathoms, carefully avoiding the Lepe and Solent Shoals.

**Anchorage.**—Between the Sturbridge and the Ryde Middle E. buoy is good anchorage everywhere, and merchant-vessels generally lie in 9, 10, 11 or 12 fathoms safely sheltered from southerly winds, and on good clean ground, Ryde town bearing from S.S.E. to S.W. by S.

In COWES ROAD the anchorage is N.N.E. of Cowes, having from 8 to 11 fathoms, good holding ground. Vessels may stop a tide anywhere between W. Cowes and Yarmouth,—the nearer to the island the more they will be out of the strength of the tide; but the places most used for anchoring are Cowes and Yarmouth. The ground in Yarmouth Road is good for holding; but the best anchoring is on the E. side near to the shore, in 6 or 7 fathoms, where you will lie out of the strength of the tide: yet care must be taken by ships at single anchor, to prevent bringing home their anchors, for the tides run strong and irregularly.

Off Lymington River, opposite Jack-in-the-Basket, vessels may anchor, with Jack in one with the church at Lymington, about half a mile from the beacon, in 3 or 4 fathoms; the ground is good, and the riding better than at either Yarmouth, Cowes, or the Mother Bark, as the tides are easier and the water smoother.

Hurst Road affords but bad anchorage in E. and S.E. winds, and is seldom used owing to the uncertain eddies, which render it very difficult to keep a clear anchor. Small vessels sometimes anchor, and a few of them can lie out of the tide at a moderate distance from the beach over a clean bottom, and a good depth of water.

From Hurst to Egypt Point there are no dangers in the channel but the Solent Banks; but long mud flats run off from the north shore, and several rocky ledges off the shore of the Isle of Wight.

**SOUTHAMPTON WATER.**—To the northward of the E. end of the Ryde Middle and to the east of the Bramble east buoy, between that and the main coast, is the principal and widest channel to Southampton. The other channels to the westward of the Bramble by way of the Thorn, have the deeper water, but they are intricate, and although well buoyed are only fit for those well acquainted with them, with steamers well under command. When the wind is between S.S.W. and E.S.E. it is fair for going up to Southampton. Several buoys are laid down on each side of the channel, which has sufficient water for vessels to proceed upwards at all times of the tide. A pier is erected at Southampton, forming a convenient place for embarkation at all times of the tide, where the steam-packets are enabled to land their passengers with ease and safety.

**Lights.**—Two white lights are exhibited from iron posts, fifteen yards apart, at the end of the Royal pier at Southampton, and when in one, the channel will be open from the bar to the end of the pier. There are also two fixed lights on the piers of the docks, dark red on the N., and red on the S. pier-head: when in one N.N.E.  $\frac{3}{4}$  E., they lead up to the River Itchen in 15 feet.

Sanction has been given for the exhibition of two fixed green lights, placed vertically, to mark the end of the extension quay, which the Southampton Dock Company are now completing on the north-west side of the River Itchen.

A fixed green light is shown on Netley pier; also a light-vessel (*Harpy*) is moored at Itchen river entrance, from which a fixed red light is exhibited.

**DOCKS.**—The tide-dock at Southampton comprises an extent of 16 acres water area, with 3,500 lineal feet of solid masonry quay wall; has an open entrance, 150 feet wide, accessible from the English Channel at all hours of the day and night, and a depth of never less than 18 feet at the lowest spring-tides, average high water 30 feet.

From Calshot Castle to the Docks at Southampton, the bearing and distance are N. by W., nearly  $5\frac{1}{2}$  miles: and in order to facilitate the navigation the edges of the banks, where requisite, have been regularly buoyed and beacons, with the red buoys on the E. side, and black buoys on the W. The only shoal on the *mid-channel track*, between Calshot Castle and the docks is the Netley Shoal of 12 feet, directly in a line between Netley Abbey and Hythe Church, and may be passed on either side in  $3\frac{1}{4}$  fathoms at low water.



When bound to Southampton, to the eastward of the Bramble, after passing Stokes Bay, give Lee Point a berth of three-quarters of a mile, and bring Calshot Castle N.W.  $\frac{1}{2}$  N., and steer for it, passing near the Hill Head or N.E. buoy of the Bramble, and leaving the light-vessel on your starboard hand. From above Lee Point all the way to abreast of Calshot Spit a shallow flat runs off the eastern shore, about three-quarters of a mile, and near the light-vessel a full mile, with only  $2\frac{1}{2}$  fathoms near its outer edge. The best water will be found near the eastern edge of the Bramble, having a narrow channel of 3 fathoms. It is high water at Southampton at 10h. 30m., and again at 12h. 45m. Spring-tides rise 13 feet, neaps  $9\frac{1}{2}$  feet.

## THE NEEDLES CHANNEL.

### Description of the Shoals.

This channel may be considered to commence at Sconce Point on the one side, and Hurst Beach on the other; it is bounded on the eastern side by the Isle of Wight, and on the western by the shoals called the Shingles, and terminates with the Chalk and Needles Rocks. On the eastern side are the How, Warden, and Tinker Ledges. Off Hatherwood Point are the Five Rocks, with from  $1\frac{1}{2}$  to 3 fathoms over them; but they are close to the land, and out of the fairway of shipping, therefore, not an object of danger. The Needles Rocks lie off the point of land called Needles Point, and are always remarkable objects, with a light-house on the outermost. The Chalk Rocks are on the western side of the channel, and near the extremity of the Shingles.

The SHINGLES extend nearly W.S.W. and E.N.E., full  $2\frac{1}{2}$  miles, and from their S.W. extremity, Hurst Castle bears E.N.E., distant  $3\frac{1}{2}$  miles; this outer part is nearly connected with the Needles Point by a narrow bar shoal, called the Bridge, on which are only  $3\frac{1}{2}$  fathoms, at the distance of three-quarters of a mile from the Needles Rocks, but towards the Shingles, are  $5\frac{1}{2}$  and 6 fathoms; and the leading marks for this channel, which lies towards the S.W. Shingles buoy are, the S. edge of Hill Farm trees E.  $\frac{1}{2}$  N., seen just S. of Warden Point. The N.E. part of the Shingles lies with Hurst Castle bearing E.N.E. distant three-quarters of a mile. This part sometimes dries, and heaps up with E. winds, and near the S.W. part the Shingles are patches with 3 or 4 feet on them.

The DOLPHIN BANK extends W.  $\frac{1}{2}$  N. and E.  $\frac{1}{2}$  S., nearly 2 miles, is a quarter of a mile broad, with from 3 to  $3\frac{1}{2}$ , and  $4\frac{1}{2}$  fathoms upon it. Its E. end, in  $3\frac{1}{2}$  fathoms, lies three-quarters of a mile N.W. by W. from the S.W. tail of the Shingles. The leading mark through the channel, between the Dolphin and the Shingles, is Milford Church, N.E.  $\frac{1}{4}$  E., seen midway between the two houses next the shore.

### Description of Lights, Buoys, &c.

**Hurst Lights.**—On Hurst Point are two light-houses, circular in form, being respectively 85 and 52 feet in height, and 76 and 46 feet above high water. The higher light-house is white; the lower, white with red lantern. These light-houses are erected in the rear of the fortifications of Hurst Castle, and bear N.E. by E.  $\frac{1}{2}$  E., and S.W. by W.  $\frac{1}{2}$  W., 223 yards from each other, exhibiting fixed white lights, visible 13 and 10 miles.

The light up the Solent is shown from the high light-house, and visible between the bearings of W. by S. and W.  $\frac{1}{2}$  N. to the light-house. At Hurst Castle it is high water, full and change, at 10 hours, and again at 12 hours; spring-tides rise  $7\frac{1}{2}$  feet, neaps 6 feet.

**ELECTRIC TELEGRAPH.**—A submarine cable extends from 400 yards W. from the W. wing of the new battery, at Sconce Point, across the Solent to the central tower

of Hurst Castle. Mariners are requested not to anchor in that line of direction, to prevent damage to the cable.

**Needles Light-house.**—A light-house has been erected on the outer Needles rock. The light burns at an elevation of 80 feet above the level of high water, and appears as a fixed red light when bearing N.W.  $\frac{1}{2}$  N. (round northerly) to E.; white from E. to E.S.E.; red from E.S.E. (round southerly) to S.W. by W., and white from S.W. by W. to S.W. by W.  $\frac{1}{2}$  W. The white light shows in the direction of the Needles Channel; its southern limit bearing east, passes  $1\frac{1}{2}$  mile south of Durlston Head, and about a cable south of outer part of Bridge Reef. Its northern limit bearing E.S.E., passes 2 cables south of Dolphin Bank and the S.W. buoy of the Shingles. The ray of white light between the bearings of S.W. by W., and S.W. by W.  $\frac{1}{2}$  W. clears the Warden Ledge. A bell is sounded during foggy weather. The tower is circular, built of granite, 109 feet from base to vane, and the white light is visible 14 miles, the red light 9 miles.

**Buoys, &c., on the eastern side of the Channel :—**

On the extremity of the Warden Ledge, a red can buoy is placed, at nearly half a mile N. from Warden Point, with the flagstaff on Sconce Point bearing E.N.E.  $\frac{1}{2}$  E.; and the E. part of Hurst Castle N.N.E. The point of Warden Ledge lies with Lymington Church open of Hurst Beach, bearing N.N.E.  $\frac{1}{2}$  E., two-fifths of a mile distant from Warden Point; on this part is  $1\frac{1}{2}$  fathom.

**CLEARING MARK.**—The mark to clear the Warden is Sconce Point, kept open of Round Tower Point, E.  $\frac{3}{4}$  N., until the Needles light-house comes S.W. by W. On the Tinker, which is an irregular shoal off Lower Warden Point, are 2 fathoms, with one spot of only 6 to 9 feet, lying half a mile from the coastguard boat-house.

**On the western side of the Channel :—**

**Shingles.**—Three buoys are laid on the E. side of the Shingles :—N.E. buoy is a red and white can buoy in rings, at the N.E. end, in  $5\frac{1}{2}$  fathoms, with a high light-house on Hurst Point open to the right of the low one, bearing N.E. by E.  $\frac{1}{2}$  E.; the Fort at Cliff's End E. by S.  $\frac{1}{2}$  S., and Needles light S.W.  $\frac{1}{2}$  W.

The Elbow can buoy, striped red and white vertically, lies in 6 fathoms, with the high light-house at Hurst open its breadth to the eastward of the low light-house, bearing N.E. by E.  $\frac{1}{2}$  E.; and Needles light S.S.W.  $\frac{1}{2}$  W.

S.W. Buoy is a large red and white chequered buoy, with a staff and cage, and lies in  $6\frac{1}{2}$  fathoms, nearly three-quarters of a mile E. by S.  $\frac{1}{2}$  S. of the tail flat of the Shingles in 5 fathoms, which is just to the northward of the line of the white light of the Needles, bearing E.S.E. The marks for the buoy are the Needles light, S.E. by E., distant five-sixths of a mile; and the low light-house at Hurst N.E. by E.  $\frac{3}{4}$  E.

**Directions.**—Being abreast of Hurst Beach, midway between that and Sconce Point, you may steer S.W. by W.  $\frac{3}{4}$  W.,  $1\frac{1}{2}$  mile, until you get the light-house on the Needles Rock to bear S.W. by W. you may then if under 16 feet draught, shape a W. by S.  $\frac{1}{2}$  S. course,  $2\frac{1}{2}$  miles, which will see you fairly over the Bridge and clear of all, or you may continue the course S.W. by W.  $\frac{3}{4}$  W., until you bring the S. edge of Hill Trees (on the Isle of Wight) E.  $\frac{1}{2}$  N., seen just S. of Warden Point; then your draught being above 16 or 18 feet you may steer W.  $\frac{1}{2}$  S., westward of the Bridge, in good water. Be particular to the set of the tides in the Needles Channel, as affecting the above courses.

**IF IN THE NIGHT TIME,** keep in the white light of the Needles light-house until you open the red light bearing S.W. by W. and Hurst light bearing about N.E.; then steer W. by S.  $\frac{1}{2}$  S.,  $2\frac{1}{2}$  miles, past the Elbow and S.W. Shingles buoys, and through the outer angle of white light, from the Needles light-house in to the outer range of red light, and to sea.

The Hurst lights in one, N.E. by E.  $\frac{1}{2}$  E., is the mark leading along the S.E. side of the Shingles into the depth of  $3\frac{1}{2}$  fathoms, at the N. point, which must be avoided by passing to the eastward of the buoy. Therefore in sailing onwards, *you ought not to bring* the lights in one, either in working, or with a fair wind, *until you are well below* the buoy of the Warden Ledge, or the Needles bear

S.W.  $\frac{1}{2}$  W., lest you fall into  $3\frac{1}{2}$  fathoms on the E. side of the Shingles, for the ebb-tide runs strongly to the N.-westward through the North Channel, and upon the E. point of the Shingles, which is particularly to be guarded against, being steep-to here, as well as all along the S.E. side; hence a good berth should be given to that part.

**NORTH CHANNEL.**—Between the Shingles and Hurst Beach is a passage called the North Channel, in some parts half a mile wide, with 5, 4 and 3 fathoms in it. The marks for this channel are, Hurst low light, nearly in one with the S. end of West Hill trees, S.E. by E.  $\frac{1}{2}$  E. in not less than 17 feet at low water, rounding Hurst Beach and the lights within a quarter of a mile. Off Milford is a rocky patch of 9 feet, called the Mineaway, about one-third of a mile from the shore. When you are to the westward of the Shingles, you may proceed to bring Egypt Point on with Hurst Castle, bearing east, which mark will lead you between the Dolphin and Christchurch Banks, in 10 and 11 fathoms.

**TIDES.**—In the Needles Channel the stream makes to the eastward a quarter of an hour after high water on the shore, or until 10h.; but in the channel opposite Cowes until 10h. 30m. The flood runs but slowly into Lymington, Beaulieu, and Southampton, till the western stream flows into Spithead: then it becomes more rapid, flowing seven hours and ebbing five. Its velocity in the Needles Channel is about 4 knots with springs, and 3 neaps; at Cowes, 3 springs, and 2 neaps; and at Spithead  $2\frac{1}{2}$  springs, and 1 neaps. Nearly 5 miles S.S.E. of Dunnose, at full and change, the stream turns at 10h. 40m., and 4h. 40m., and sets E.  $\frac{1}{2}$  S. and W. by N.; velocity from 4 to 5 knots, but S.E., 2 miles from Dunnose, the flow sets E. by N., and turns at the same time as at Portsmouth Harbour, and the ebb W.S.W., but one hour earlier than it does in the harbour. Off St. Catherine's Point the sea breaks violently during springs in westerly gales.

**TO TAKE THE NEEDLES CHANNEL FROM SEA.** By Day the leading mark to enter the Needles Channel in the best water, not less than 27 feet, between the S.W. chequered Shingles buoy and the W. end of the Bridge, is to bring the S. edge of Hill E.  $\frac{1}{2}$  N., seen just south of Warden Point; proceed with this mark until the Needles light-house bears S.S.W., then steer E.N.E., keeping the Hurst light-house a little open; take care not to bring the Needle Rock light-house to the southward of S.W. by W.  $\frac{1}{2}$  W.; and when Sconce Point comes well open of Round Tower Point you will have cleared the Warden Ledge to the westward; then continue up mid-channel.

In case of northerly winds, and you are to the northward of the Needles Channel, bring the Needles light-house to bear S.E. by E.  $\frac{1}{2}$  E., and it will lead across the Dolphin Bank in 4 fathoms at low water, and up to the S.W. buoy of the Shingles.

In working through the Needles Passage (which, however, should not be attempted by any except small vessels, unless there be urgent necessity for it), ships may stretch so far to the westward as the S.W. Shingle buoy, to where the Needles light-house bears S.E.  $\frac{1}{2}$  E.; but higher up the channel, beyond that bearing, they must not stretch further westward than to bring the Hurst light-houses in one, bearing N.E. by E.  $\frac{1}{2}$  E., and to the eastward to where the Needles light-house bears S.W. by W.  $\frac{1}{2}$  W. until past the Warden Ledge.

**By Night.**—In coming from the westward you must not bring the Needles Rock light to the southward of E.S.E., or lose sight of the white light until the Hurst lights are in one, bearing N.E. by E.  $\frac{1}{2}$  E.; then, if your draught will allow, run over the Bridge with that mark, into the red range, and when the Needles Rock light is S.S.W., keep Hurst high light open to the eastward of the low light; steering up the channel with this latter mark, one mile or a mile and a half, edge away to the eastward, and enter the northern range of the white light of the Needles light-house, and take care not to lose sight of it, for should you do so you will be near the Warden Ledge; from thence continue mid-channel between Hurst and Sconce Point into the white range of light from the high light-house at Hurst, which shows between the bearings of W. by S., and W.  $\frac{1}{2}$  N.

**CHRISTCHURCH HARBOUR.**—Christchurch Head lies N.W. by W.  $\frac{1}{2}$  W. from Hurst Castle, distant about  $7\frac{1}{4}$  miles, and the harbour entrance is three-quarters

of a mile to the N.-eastward of the headland. There is good anchorage in the bay to the eastward of the harbour's mouth, about  $1\frac{1}{2}$  or 2 miles from the shore, in  $4\frac{1}{2}$  or 4 fathoms, with the white summer-house on Poole Head just open to the S. of Christchurch Head; but Christchurch is a bar-harbour, and accessible to small vessels, drawing 5 or 6 feet, only at high water; the sands also are continually varying their positions.

**Christchurch Ledge.**—From Christchurch Head runs a long ledge, in a S.S.E.  $\frac{1}{2}$  E. direction,  $2\frac{1}{2}$  miles, having near the shore only 3 feet, and increasing as it runs to seaward to 3 and 4 fathoms; the mark to run in between it and the Dolphin is Hurst Castle on with Egypt Point, in 10 and 11 fathoms. During the day the black buoy will be seen.

**Buoy.**—A black buoy, marked "Christchurch Ledge," is placed in 3 fathoms at low water, near the middle of the ledge, with the S.E. extreme of the ledge, S.E.  $\frac{1}{2}$  S,  $1\frac{1}{2}$  mile; and Christchurch Head N. by W.  $\frac{1}{2}$  W.,  $1\frac{1}{2}$  mile; and it must be remarked that there are only  $2\frac{1}{2}$  fathoms on the edge of the ledge at twice that distance from shore. Another conspicuous buoy at the latter spot would be well laid.

A clump of trees on a distant hill open west of Highcliff trees N. by E.  $\frac{1}{2}$  E., leads across the ledge in  $2\frac{1}{2}$  fathoms, to the eastward of the buoy.

To go to the eastward of this ledge, bring Christchurch tower well open to the eastward of Christchurch Head, bearing N.N.W.  $\frac{1}{2}$  W.

To go to the westward of this ledge, bring Christchurch Priory tower just open to the westward of Christchurch Head, N. by W.  $\frac{1}{2}$  W., this clears the ledge half a mile from the shore; and Nodes beacon, on the Isle of Wight, in line with the junction of the red and white cliffs in Alum Bay, E. by S.  $\frac{1}{2}$  S., leads southward of the ledge, and also the Dolphin Bank, up to the fairway of the Needles Channel.

**TIDES.**—It is high water, full and change, at Christchurch at 9h., and again at 11h. 30m. at the haven house. Spring tides rise 5 feet, at Old Groyne 7 feet, but only 3 feet at the town.

From Christchurch Head to Standfast Point (on which stands a battery), the bearing is W. by S., distant  $7\frac{1}{2}$  miles. At this point is a remarkable detached piece of land, somewhat like a pinnacle, called Old Harry, and another near it named Old Harry's Wife, through which you may see into Studland Road. The coast between these places takes a semi-circular sweep, having Poole Harbour to the westward.

In the N.W. part of Poole Bay, between Bournemouth and Poole Head, and within  $1\frac{1}{2}$  mile of the shore, are five small patches, and from 18 feet to 8 feet on them. The three outermost are named, Outer Poole Patch, Middle Poole Patch, and Bournemouth Rocks, with 15 to 18 feet on them, and 6 to 7 fathoms round them. Poole low light N.W. by W. clears them all to the southward; and Bournemouth Church, N. by E.  $\frac{1}{2}$  E., clears them all to the eastward. The two inner patches, of only 8 feet, lie within half a mile of the shore. The easternmost, named Durlly Rock, lies one-third of a mile S. of Little Durlly Chine; and the western patch, named Inner Poole Rock, lies half a mile S. by E.  $\frac{1}{2}$  E. from Poole Head coast-guard station.

**POOLE BAR** lies W.N.W. from the Needles Point, distant about 13 miles, and about 1 mile N. by E.  $\frac{1}{2}$  E. from Old Harry Point; on it are generally only  $14\frac{1}{2}$  feet at high water, and from 7 to 8 feet at low water, ordinary spring-tides, according to wind and weather. The bar of Poole Harbour is liable to shift, and the channel now in use, and the only one buoyed, is the Swathway, marked on the star-board side by black can buoys, and on the port side by red cask buoys (striped vertically with white).

A bell beacon has been placed on the third red buoy (striped white) on the port side, approaching this harbour. The ball is also painted red (striped vertically with white).

A stranger should always take a pilot.

When southerly or easterly winds prevail, there is a considerable sea at the entrance, and no stranger should in those cases attempt it; but, under favourable or urgent circumstances, steer for the entrance, between the black can buoys on

the starboard hand and the red cask buoys on the port, N.N.E., until Latchet trees (a large clump of trees on the high back land over Poole) comes on with the N. end of the coast-guard building on Brownsea Island, N. by W.  $\frac{1}{2}$  W. This mark leads in the best water between the haven points; then keep mid-channel until abreast of the castle, and anchor.

**POOLE Harbour-lights, with Directions.**—Two fixed white lights, upon the eastern side of the entrance to Poole Harbour, for the guidance of vessels to the port at night, and exhibited from sunset to sunrise, visible 6 miles.

The lights are placed 262 yards apart, S.  $\frac{1}{2}$  E. and N.  $\frac{1}{2}$  W. of each other; the lower and southernmost 16 feet, and the higher 37 feet above the level of the sea at high water spring tide. The low light is masked between the bearings of N. by E.  $\frac{1}{4}$  E. and N.  $\frac{1}{2}$  E. The high light is visible about 6 miles. There are 4 more fixed lights within the entrance. A white light on N. Haven Point, a white light near Lilliput Farm, and two red lights at the town. The lights from North Haven to Flag Farm will be discontinued on the 15th April until the 15th day of September in each year.

To enter the Harbour by the Swash, the lights must be brought in one, bearing N.  $\frac{1}{2}$  W. which will lead clear of all the shoals to the Haven Point.

N.B.—The lights and these directions are intended mainly to assist those acquainted with the navigation of the port, and not to encourage strangers to attempt the harbour by night without a pilot; but, under circumstances of emergency, when no pilot could be obtained, and when it might be imperative to seek shelter at all hazards, they would certainly be of great assistance.

**STUDLAND BAY.**—Good anchorage may be found in easterley gales in Studland Bay for vessels under 12 feet draught, close in and abreast of three remarkable projections in the Chalk Cliffs called the Yards, with Old Harry S.E. by S., and Agglestone W.N.W., and open N. of coastguard of Redend Point. In westerly gales Studland affords excellent shelter.

**TIDES.**—Poole Harbour enjoys an unusual advantage, namely, that of the ebbing and flowing of the tide twice in 12 hours: it first flows regularly for 6 hours, and ebbs for  $1\frac{1}{2}$  hour; it then flows again for  $1\frac{1}{2}$  hour, and ebbs during the remaining 3 hours. The second flood seems to be owing to the peculiar situation of the mouth of the river.

Being in a bay open to the E., the tide of ebb, from between the Isle of Wight and the main, falls into that bay, and forces its way into the river, so as to raise the water from  $1\frac{1}{2}$  hour; at which period the water outside the bar, by its falling below the level of that within produces a second ebb for the space of 3 hours, or until it is low water. High water, full and change, at Brownsea Quay at 8h. 50m. and again at 12h. 25m.; at Poole Quay, it flows at 9h. 10m., and again at 12h. 45m.; springs rise  $6\frac{1}{2}$  feet, neaps  $4\frac{1}{2}$  feet. At Wareham Quay, 6 miles, above Poole, springs rise 4 feet, neaps  $2\frac{1}{2}$ .

**SWANAGE BAY.**—S.W. from Old Harry Point about  $2\frac{1}{2}$  miles, is Peverel Point and Ledge, and three-quarters of a mile further, in the same direction, is Durlston Point; between the two former is Swanage Bay, a place of very indifferent anchorage, having several rocks within it, as well as off Peverel Point; but bring the little round hummock N. of Swanage on with a mill that stands further inland, or bring Old Harry Point to bear N.E.  $\frac{1}{4}$  E., and you can anchor in 3 or 4 fathoms, gravel and sand, sheltered from S.W. winds. Off Durlston Point is a small rock, above water, close to the land. It is proposed to place a light on the Pier at Swanage.

**PEVEREL Buoy** is black, in  $5\frac{1}{2}$  fathoms, on the outer extreme of the Ledge; with Old Harry N.E. by N.; Durlston Head S.W. by W.; and Swanage Battery W.N.W.

**To Sail from the Owers to the Southward of the Isle of Wight.**—Steer from abreast of the Owers light-vessel W. by N. about 19 miles, and you will then be opposite Dunnose; from whence to St. Catherine's Point is 5 miles, W.  $\frac{1}{4}$  N.; from St. Catherine's Point to the Needles is 13 miles, about N.W.  $\frac{1}{4}$  N.; and from the Needles to Durlston Head 14 miles, W. In this passage are several overfalls.

[E. CHANNEL.]

called races, running out from and between Dunnose and St. Catherine's Point; off the latter is some foul ground at Rocken-end, extending half a mile from the coast; and from hence to the Needles the shores are rocky, and the ground for that distance to seaward foul, particularly off Atherfield and Brook Points, where the rocks nearly dry. St. Andrew's Rock, of  $4\frac{1}{2}$  fathoms, in Chale Bay, lies N.W.  $\frac{1}{2}$  N., 2 miles from St. Catherine's Point, having from 6 to 7 fathoms, between it and the island, from which it lies nearly two-thirds of a mile. Chale Rock, of 4 fathoms, lies N.W.  $\frac{1}{4}$  W. from St. Catherine's Point, and about the same distance from the land.

**ST. CATHERINE'S LIGHT-HOUSE** is erected on St. Catherine's Point, the southernmost point of the Isle of Wight, and is an octagonal, stone, castellated building, and exhibits a fixed light of the first order 134 feet above the sea, and visible at the distance of 17 miles. It is visible seaward between the bearings of S.E.  $\frac{1}{2}$  E. and W.  $\frac{3}{4}$  N.

**Fog Horn.**—A powerful fog horn is sounded from St. Catherine's light-house in thick weather, to warn vessels of their approach. The mouth of the horn is at an elevation of 81 feet above high water, and will traverse an arc of  $215^\circ$ , viz. :—from E.  $\frac{3}{4}$  S. round S. to N.W., and will point in every direction between those bearings the duration of the sound being two blasts in quick succession every four minutes.

**TIDES.**—The flood from Durlston Head sets near the shore into Poole and Christchurch Bays, and thence over the Shingles to Sconce Point, and within the distance of 2 leagues from Durlston Point it runs into Freshwater, Brixton, and Chale Bays; but beyond that distance directly up Channel.

Between St. Catherine's and Durlston Heads are from 18 to 13 fathoms. In sailing along you will observe an indraught, setting in the flood toward the Needles Passage, which must be properly allowed for.

**N.B.**—Off many of the principal points or headlands of the South Coast of England, there occurs a race or overfall, more or less strong, according to the configuration of the neighbouring coast, and state of the tide. At night time or in thick weather, suspicion should always be awakened by such appearance, as it indicates either the near approach to some salient point, or the proximity to a shoal; and it may be generally inferred, that 2 miles outside the fair streamage of headlands there is little or no indraught.

### FROM DURLSTON POINT TO THE START.

From abreast of Durlston Point to St. Alban's Head the bearing and distance are W. by N., 4 miles; the latter is a bold headland 359 feet high, having on the top an ancient chapel. The ground off St. Alban's Head is foul, extending to the southward, or abreast of the head, about a mile. A kind of race, or overfall, is observable at this point, both with ebb and flood, stretching to the westward; an eddy also attends the ebb-tide. About a mile to the northward of St. Alban's Head is Chapman's Pool, where, with small vessels and easterly winds, you may stop a tide of ebb. From hence a rocky ledge runs along shore at the distance of half a mile, about 4 miles; this is called Kimeridge Ledge: the marks to go clear of it are, St. Alban's Head, S.E.  $\frac{3}{4}$  E., and Arishmill Gap, open of Worbarrow Head, bearing N.W.  $\frac{3}{4}$  N.

Besides Chapman's Pool, there are several coves along the shore on this part, fit only for small craft; these are, Kimeridge Bay, Worbarrow Bay, and Lulworth Coves; this latter is a safe harbour, the wind being W., northerly, or N.E.; but S. westerly winds blow in. The entrance is between two bluff points.

**WEYMOUTH.**—The entrance to Weymouth Harbour lies N.W. by W.  $\frac{1}{4}$  W., 15 miles from St. Alban's Head. On the bar of this harbour are no more than 9 feet at low water; but within the bar is a small place in which are 10 feet; spring-tides rise 7 feet, neaps  $4\frac{1}{2}$  feet. The channel into this harbour is narrow, and the deepest water is nearest the N. shore. E.S.E. from the flagstaff, and close to the shore, is a small rocky shoal, called the Mixon. There is a very good riding

in Weymouth Road, half a mile E.S.E. from the jetty head, in 7 or 8 fathoms. The N. end of Melcombe, open to the northward of the pier on North Point, leads to the northward of the Mixon, and also to the anchorage in the road; the other mark for the latter is Blacknor Point, on with Portland Castle; you will then have 6 fathoms; but by bringing Blacknor Point just open with Fern Hill, you will lie further out in 8 fathoms.

**Lights.**—The Harbour of Weymouth was formerly marked by a light shown from a lantern on a pile at the south side of the entrance to the harbour; but a few years since a violent gale destroyed it, and a buoy now marks the site where it stood; since which time the following is the arrangement of the lights—

Two red lights are exhibited at the north part of the town, bearing from each other N.N.W. and S.S.E.

The lights in a line bearing N.N.W. will lead vessels in the direction of the harbour, clear of the Mixon; care being taken not to open the higher light to the left, or westward of the lower.

Vessels should proceed with these red lights in one, until two green lights placed on the north pier, are brought in a line bearing W.  $\frac{1}{2}$  S., which is the leading mark in, until within 50 or 60 yards of the east light, then keep mid-channel up the harbour.

**PORTLAND HARBOUR OF REFUGE.**—What was formerly termed the Road of Portland is now enclosed by one of the finest stone breakwaters that have as yet been constructed in England. This harbour is formed to the south of the town of Weymouth, and the first portion of the breakwater starts from the N.E. shoulder of Portland Island in an easterly direction, 2000 feet, where there is an opening or entrance 400 feet wide. On the eastern side of this opening it curves round and takes a N.N.E.  $\frac{1}{2}$  E. direction for 7000 feet to its N.E. extreme, enclosing an area of 4,310 acres, varying in depth from 3 to 9 fathoms, which affords a safe harbour of retreat to vessels caught by bad weather in this part of the Channel.

**Light.**—On the fort at the north end of the breakwater is a fixed red light, visible from seaward and over Portland harbour, but it is obscured by Portland peninsula between the bearings of N.N.E. and E. by N.  $\frac{1}{2}$  N.

The light is also visible from West Bay, over Chesil Bank, between the bearings of E. by N.  $\frac{1}{2}$  N. and E.S.E., but to an observer 15 feet above the sea approaching within  $2\frac{1}{2}$  or 2 miles of Chesil Bank, the light will dip below the land.

The light is elevated 57 feet above high water, and in clear weather should be seen from a distance of 8 miles.

Vessels are, in all cases, recommended to keep not less than a full cable's length to the eastward of the light.

In running for the new harbour of Portland you may take either side of the Shambles Shoal, and no pilot is required, for there is nothing to prevent you making a fair course for the harbour out of the way of a heavy gale; and sometimes there are numbers of vessels seeking or taking shelter under the new breakwater. The bottom is mostly of blue clay, good for holding, and therefore a berth must be taken up according to circumstances, and qualities of the vessel for making her way to sea again upon a change of wind.

**PORTLAND.**—**Lights.**—The peninsular of Portland is about  $3\frac{1}{2}$  miles in length from the N. point of the Bill, in a N.E.  $\frac{1}{2}$  N. and S.W.  $\frac{1}{2}$  S. direction, and a little more than a mile in breadth. It has two circular white light-houses on it, which stand at a short distance from the Bill, both showing fixed lights. The high light is elevated 210 feet above high water, and bears from the low light-house N.N.W.  $\frac{1}{2}$  W., distant 1,500 feet, visible 7 leagues off; the lower light is 136 feet above high water, and visible 6 leagues when bearing between S.E. by E.  $\frac{1}{2}$  E. and W. by S.  $\frac{1}{2}$  S. The lights in one, N.N.W.  $\frac{1}{2}$  W., lead between the Race and Shambles.

**Beacon.**—On the extreme point of the Bill a stone beacon 20 feet high, and its summit 60 feet above high water, is placed as a guide for small vessels, to guard them against a low shelf of high water rock, the top of which has been quarried away for nearly 100 feet; large loose stones and masses of rock extend at least 150 feet beyond this point.

The SHAMBLES is a dangerous shoal, composed of coarse sand and shingles; steep all round and always to be known by the rippling of the water over it: close to its outer edge are 16 fathoms, and the least water on it is 11 feet; at this latter depth Portland Church Spire is in line with the S. side of Church Cove, bearing N.N.W.  $\frac{1}{4}$  W. The E. end of the Shambles bears from St. Alban's Head W.  $\frac{1}{4}$  N., distant  $11\frac{1}{2}$  miles, and from the Bill of Portland E.S.E. 4 miles; the shoal extends thence W.  $\frac{1}{4}$  N., about 2 miles.

The Light-vessel off the E. end of the shoal has one mast, carries one fixed white light 38 feet high, and is moored in 15 fathoms, with Portland Bill W.N.W.; St. Alban's Head E.  $\frac{1}{4}$  S.; and Wyke Regis Church tower N.N.W.  $\frac{1}{4}$  W. On board this light vessel is a fog-signal, giving one blast every two minutes.

At the W. end of the Shambles, in 6 fathoms, Portland Spire bearing N.  $\frac{3}{4}$  W. will be open W. of the windmills on the isle. To go to the northward of the Shambles, you must bring Anvil Point, near Durlston Point, just open to the southward of St. Alban's Head; this mark will lead a quarter of a mile to the northward of the Shambles, in 14 fathoms. To clear the E. end of the Shambles in 12 fathoms, bring Wyke Regis Church open of the N. end of Portland, N.N.W.  $\frac{1}{4}$  W.; and Anvil point open of St. Alban's Head, the latter bearing E.  $\frac{1}{4}$  N., leads to the southward of the Shambles.

Between the Shambles and the shore, nearly half-way, there are from 14 to 15 fathoms, and close in-shore will be found 9, 8, 7, and 3 fathoms.

Passage between Portland and the Shambles.—At night the leading-mark is the two lights in one, N.N.W.  $\frac{3}{4}$  W.; until the E. end of Portland bears N.N.E., when you may steer towards it. Mr. Spence recommends, with a flood-tide, to keep Portland high light a little open to the S.W. of the low light; and he also observes, that this channel should not be used by strangers without a commanding breeze. Spring-tides run  $6\frac{1}{2}$  knots, and set directly on the Shambles.

The Race of Portland lies to the southward of the Bill, or southernmost part of Portland; it is a great rippling of the water, caused by the unevenness of the bottom. In the Race you will shoal from 18 to 7 fathoms, and quickly deepen again to 10 and 15 fathoms; and you will continue to do so until you are through it. At spring-tides, and when the sea is high, it breaks heavily, making it very dangerous for small laden merchant-craft. The distance of the Race from the Bill varies, according as the winds are northerly or southerly; with the former it is  $1\frac{1}{2}$  mile from the Bill, and with the latter it is not more than three-quarters of a mile distant. Small vessels frequently sail within the Race, between it and the Bill, without any danger; between them are  $5\frac{1}{2}$ , 6, and 8 fathoms, and within a cable's length of the Bill are 3 fathoms; but on the S.E. side there is a flat of about 2 cables' length; this you will know by the ripple over it.

TIDES.—On full and change, it is high water at the Portland Breakwater at 7 hours; springs rise  $6\frac{3}{4}$  feet, neaps  $4\frac{1}{2}$  feet. Near the W. end of the Shambles, with the lights in one, the western stream makes at 10h. 15m., and the eastern stream at 3h. 45m.; the flood running  $3\frac{3}{4}$  knots, and the ebb  $2\frac{1}{4}$ .

In proceeding to Portland Road from the westward, as soon as you see the lights on the Bill, keep well out to the southward; and when the lights come in a line with each other, bearing N.N.W.  $\frac{3}{4}$  W., you will be past the E. end of the Race, and may, by steering S.E. by E., pass to the southward of the Shambles. When to the westward of the Race, with a southerly wind, and you are doubtful if you can hold to the southward of the Shambles, you may venture between the Race and the Shambles, more especially if you have slack water, or an ebb-tide; and proceed to Portland Road, within the Breakwater.

WEST BAY is on the N.-western side of the Bill of Portland, and affords very good shelter against winds from between S.S.E. and N. by E.; the bottom is, however, coarse loose gravel, or shingle, and the depth from 16 to 20 fathoms, distant about a mile from the shore; at the anchorage Portland Bill bears from S. to S. by E., and Chesilton village from E.N.E. to S.E. For 9 hours in 12 the stream sweeps along the cliffs to the E. and southward; and should an unexpected



and sudden gust of wind occur, vessels may be able to clear the Bill, or run for Bridport.

Captain M. White says, that "The greatest foresight is necessary when using this anchorage in the winter season, in order to provide against sudden shifts of wind; as those which blow strong from the westward and southward send in a very heavy turbulent sea, against which few anchors would hold, or few vessels could attempt to beat, with any prospect of success; for although the tide sweeps strongly along the cliffs to the southward, yet the influence thereof is too closely confined to the shore to produce any advantageous effect on vessels striving to gain an offing. It is, however, possible, between the periods of half-flood and half-ebb, to work out of the anchorage with the wind at all to the southward of S.S.W.; and from half-ebb to half-flood the attempt might succeed, provided the wind was in any degree to the northward of W.N.W.; but a vessel is at all times much safer at sea than in West Bay."

If a vessel should be so embayed as not to be able to get round the Bill, and the wind and sea should happen to be so high as to render coming to an anchor impracticable, the best method will be, if in a small vessel, to run from Bridport Pier, which is  $5\frac{1}{2}$  leagues N.N.W. from the anchorage in West Bay; at either side of the piers the ground will be found good, and on its eastern side you may run aground with safety.

**BRIDPORT HARBOUR** lies  $5\frac{1}{2}$  leagues N.N.W. from the Bill of Portland. It is  $1\frac{1}{2}$  mile S. of the town, having two wooden piers, and several houses scattered about the beach. At  $1\frac{1}{2}$  cable's length from the outermost pier is a warping buoy, in  $2\frac{1}{2}$  fathoms, sandy ground; and W.S.W.  $\frac{1}{2}$  W., about half a mile from the point of the same pier, is a rocky shoal, called the Pollock, with 11 feet over it, though around it are 4, 5, 6 and 7 fathoms. Down Hall (a large white house, situated among some trees on the northern side of Bridport) on with Bridport W. pier-head N.E. by N., leads eastward of the Pollock. When a remarkable hill, with a house and a flagstaff on it, called Puncknoll, is on with the E. end of the cliff near Burton Hive, bearing S.E. by E.  $\frac{1}{4}$  E., you will be to the southward of the Pollock and High Grounds. This latter is a shoal about three-quarters of a mile from the former, and bearing W.N.W.  $\frac{1}{4}$  W., about  $1\frac{1}{2}$  mile from the pier; over this are 9 feet; Puncknoll just on the W. side of Burton Hive will lead on its inner edge, and clear the rocks at Golden Cape. At Bridport the bar dries at low water, and has 12 feet at high springs; within is a basin capable of holding about 30 vessels, safe at all times. The Golden Cape is the highest land hereabout; under which, to the eastward, about a mile, a vessel in distress may run on shore at a place called Seaton Beach, at an hour ebb, and by staying on board a quarter of an hour, may reach the shore, and save lives.

**LYME REGIS.**—About  $3\frac{1}{2}$  miles from Golden Cape,  $6\frac{1}{2}$  from Bridport, and 22 miles N.W. by N. from the Bill of Portland, is Lyme Regis: it is a small harbour, and dries at low water. The Cobb, or pier, a substantial stone structure, shelters small vessels within it from south-westerly gales: while the inner pier and north wall protect it from the swell caused by gales from the south-eastward. Inside the piers the bed of the harbour is hard, and vessels, upon taking the ground, bump heavily, especially if an outside easterly sea makes a run in the harbour. With westerly winds there is a pretty smooth surface. At the end of Cobb there is an arm of the pier to a heap of stones that is marked by a beacon.

**Lights.**—On the Inner Pier-head, and custom-house, bearing N.W.  $\frac{1}{4}$  N. and S.E.  $\frac{1}{4}$  S. of each other, distant 275 yards. A red light is shown from the lamp on the pier, and a red light from the lamp on the custom-house; the former is elevated 12 feet, and the latter 21 feet above high water, and visible 4 miles. The red light at the custom-house, just open eastward of the red light on the pier, clears the outer Cobb, and leads to the inner pier-heads. White light in centre of channel N.  $\frac{3}{4}$  W. high water, full and change, at 6h. 21m.; springs rise  $11\frac{1}{2}$  feet, neaps  $8\frac{1}{2}$ .

At 6 miles from hence is Beer Road, where vessels may anchor before the town, with northerly winds, bringing the point about W. by S., and Beer village N.N.W. in about 5 fathoms over sandy bottom; the landing is best at half-flood, being flint

stones. To the eastward is Seaton and Axmouth, the latter having a creek, at the E. part of which you can land with winds from W. to N. and E. at any time of the tide.

Off the village of Axmouth there was formerly a roadstead for shipping, but on Christmas day of the year 1839, there occurred a convulsion which changed the character of the coast and depths of water near it.

Beer Head is a lofty and precipitous chalk cliff, 426 feet high, and three-quarters of a mile to the westward of the head is the westernmost chalk cliff in England, W.N.W.  $\frac{1}{2}$  W., about  $4\frac{1}{2}$  miles from which is Sidmouth, an open place, with fine shingly beach before it, and good landing at half-flood; at low water it is all shoal. Chit Ledge just to the westward, dries at half-tide.

Salcombe Hill, 535 feet high, rises about three-quarters of a mile to the eastward of the town of Sidmouth, and the High Peak Hill about a mile to the westward, both close to the coast, and forming a valley, through which the River Sid flows close to the east side of the town.

Nearly 5 miles S.W. by W.  $\frac{1}{2}$  W. from Sidmouth is Budley Salterton, a village, with a fine beach before it, at the E. part of which is a river, frequented by small craft at high water, sheltered by Otterton Head and Ledge from easterly winds. Approaching the anchorage of the village, be careful to avoid the Foot Clout Rock, having only 2 feet water on it, lying half a mile S.E. by S. of the Chapel: also Otterton Ledge, which runs off a quarter of a mile S.W.  $\frac{1}{2}$  W. from Otterton Point.

Needlesham Cove is a mile further, sheltered from westerly winds, and has good anchorage for coasting vessels to stop a tide, on clean sandy ground, in 5 fathoms.

**EXMOUTH BAR** lies about 12 leagues N.W. by W.  $\frac{1}{2}$  W. from the Bill of Portland, and 19 miles W. from Lyme Regis; this bar is dangerous, and should not be attempted by those who are unacquainted with it. The entrance is narrow and intricate, having rocks on the E. side, and sand on the W. side, with not more than 7 feet over the bar at low water, and at high water 16 and 17 feet. Vessels, when within the bar generally anchor off Starcross, where they lie afloat in 10 or 12 feet. Those who go up to the town of Topsham, lie alongside the quay, and ground at low water. Goods are conveyed from Topsham to Exeter in lighters. Outside Exmouth Bar, and about a mile from the W. shore, is good anchorage in 6 or 7 fathoms, Straight Point bearing E. by N., or E.N.E., and Langstone Rock N.W., or N.W. by W.

The entrance to this harbour is almost blocked up with sands; the largest and outermost is called the Pole, and is covered at high water. The common channel in, is to the eastward of this sand; the passage is narrow and intricate, but is now well buoyed.

**Buoys.**—The Fairway buoy off Exmouth Bar is a black and white beacon buoy, in horizontal rings, in 6 fathoms, with Exmouth Church in one with the S.E. house on Beacon-hill, N.N.W.  $\frac{1}{2}$  W., and Mamhead Tower just open N. of Langstone Point, W. by N.  $\frac{1}{2}$  N. When  $1\frac{1}{2}$  cable's length to the southward of the Fairway buoy, bring the engine chimney in one with Exmouth Point, N.W. by N.; these marks lead up the harbour, leaving four buoys coloured black and white, in vertical stripes, on the port, and six black buoys on the starboard. When off the custom-house the channel bends suddenly to the westward, half a mile, and again northward, up to Starcross.

Just to the westward of the Fairway buoy, a vessel may stop in 22 feet till the tide serves to enter.

High water, full and change, at 6h. 21m.; spring-tides rise  $12\frac{1}{2}$  feet, neaps  $8\frac{1}{2}$  feet.

Dawlish Rock, on which are only 11 feet at low water, with 19 feet to 21 feet near it, lies off Dawlish, about 4 cables' length of the shore, with Exmouth Church just open of Warren Point, N.E.  $\frac{1}{2}$  E.; and Mamhead Tower and Dawlish coast-guard flagstaff in one, N.W. by W.  $\frac{1}{2}$  W.

**TEIGNMOUTH** is 5 miles W. by S.  $\frac{1}{2}$  S. from Exmouth Bar. This is a bar-harbour, frequented only by coasters, and vessels from Newfoundland, &c. With

westerly winds there is a tolerable anchorage in Babbacombe Bay, 3 miles to the southward, with 5 and 6 fathoms, half a mile from shore.

**Light.**—A fixed light is shown from a tower, erected on the S.W. side of a place called the Denn, on the northern side of the entrance to Teignmouth. The light is fixed, of a red colour, visible in all directions seaward, and burns at an elevation of 34 feet above high water. From the light, Hopes Nose bears S. by W.  $\frac{1}{4}$  W., distant 5 miles, and Straight Point E. by N.  $\frac{1}{4}$  N., distant  $6\frac{1}{2}$  miles. There is also a small shifting light of a red colour, placed in a house behind the light-house. These two lights in one lead to the Fairway and clear the rocks off the Ness and South Pole Sands.

The bar of the harbour nearly dries at low water, having but a foot of water over it at low spring-tides, and is ever changing, from the effects of strong freshes and southerly gales. Within the harbour there is a depth of 7 to 15 feet. Off Ferry Point, 3 cables' length within the bar, is a spot with 20 to 30 feet; above this it again shallows, and at the mooring-buoys, off the custom-house, are from 10 to 14 feet. The entrance is crooked; from the bar it runs first W.N.W., then bends suddenly to N.E. up to the town. High water at 6 hours; springs rise 13 feet, neaps  $9\frac{1}{2}$  feet.

About  $4\frac{1}{2}$  miles to the southward of Teignmouth Bar, is Hopes Nose, the northernmost point of Torbay. Near this point are four small islands, or rocks; the easternmost one is called the Orestone, the next the Loadstone, or Flat Rock, which lies close to the point; between this rock and the Orestone is a channel, in which are 6 to 9 fathoms. The next is the Thatcher Rock; and the westernmost is the West Shag Rock, together with the E. Shag. Close to these rocks are from 5 to 10 fathoms: the ground between them and the shore is rocky.

**TORBAY.**—The entrance of Torbay, formed by Hopes Nose on the N., and Berry Head on the S. side, is nearly 4 miles wide, the ground generally clear from rocks, and good for holding. In sailing in, you may, if necessary, keep close to either Berry Head or the Orestone. If you go between the Orestone and Flatstone, keep about mid-channel, and do not approach too near the W. side of the Orestone, for on that side the water is shoal half a cable's length from the rock.

A little more than a cable's length S.W. by S. from the Orestone, is a sunken rock, with no more than 2 feet over it, which you will be careful to avoid; and at half a mile W. by N. from the Thatcher lies the Morris Rogue, with only  $4\frac{1}{2}$  feet over it. Orestone, its own length open of Thatcher, E.  $\frac{1}{4}$  S., clears all shoals on the N. shore of Torbay, and with the whole of Torquay Pier open of Beacon Hill, marks the anchorage in Torquay Roads. Small vessels may anchor further in to wait for tide when going into the pier.

**Torquay.**—The town of Torquay stands on the northern shore of the bay, at the meeting of two deep valleys. It has an inner and outer harbour, but dries out at low water. The entrance is 145 feet wide, and at springs there is a depth of 14 feet.

**Lights.**—A red fixed light is placed on the pier head of the outer harbour at Torquay, all night, elevated 15 feet, and visible 5 miles. Also a fixed light on the pier head of the inner harbour, showing white seaward and red westward. High water, full and change, at Torquay, at 6 hours. Spring-tides rise  $13\frac{1}{2}$  feet, neaps 10 feet.

**Paignton Harbour.**—On the western shore of Torbay, almost midway from the north and south shores, is Roundham Point, and on the north side of the point is the Small tidal pier harbour of Paignton, having 10 feet water at springs, and about 8 feet at neaps, but dries out at low tide. The harbour is small, not more than 4 acres, the entrance 145 feet in width.

The Ridge is a rocky patch, and the only foul ground in Torbay, with  $3\frac{1}{2}$  fathoms upon it; the marks for it are the Thatcher on with Hopes Nose, N.E. by E.  $\frac{1}{4}$  E., and Smoky House Mill (in ruins) in line with the western fall of the red cliff on the S. side of Roundham Point, N. by W.  $\frac{1}{4}$  W.

**Anchorage.**—In Torbay you may anchor in 6, 7, 8, and 9 fathoms; the ground is strong clay. The marks are Berry Head south, S. by E., or S.S.E., and Brixham

Church on with the pier-head; but the best anchorage is about  $1\frac{1}{2}$  mile from Brixham pier-head in 7 fathoms. Ships may also ride on the N. shore, well sheltered. Easterly winds bring a great swell into this bay; but by lying about  $1\frac{1}{2}$  mile from Brixham pier-head, you will have an underset to windward, which will cause you to ride safer than you would in any other part of the bay.

Large ships must not anchor nearer the S. side of the bay than to have Paignton Church on Roundham Point, N.W.  $\frac{1}{2}$  N., nor to the westward of the high part of the Thatcher over the narrow neck of Hopes Nose, N.E.  $\frac{1}{2}$  N.

**Brixham.**—Brixham is a small fishing town on the southern shore of the bay, about a mile to the westward of Berry Head, and has a pier harbour dry at low tide, and a depth of 10 feet at high spring-tides. The entrance is 163 feet wide, where at the spring-tides there will be found 17 and 20 feet water. Besides the pier at Brixham there is, about  $2\frac{1}{2}$  cables eastward, a breakwater in course of construction, having already extended 250 yards from the shore, and affords shelter for small vessels.

**Light.**—At the head of the pier at Brixham, at 600 or 700 feet from land, a red fixed light is exhibited all night from an iron stand, visible 6 miles. Vessels by night must be kept to the northward of Shoalstone Point, to open red light placed on the inner pier, which will lead them clear of breakwater.

From Berry Head the coast turns S.W., with several indentations, 3 miles to Downend Point, then W.S.W. to the Mewstone, E. of Dartmouth Harbour. In the first space, we meet with the Cod Rocks, two steep rocky islets 50 feet high. The outer one bears S. by W.  $\frac{3}{4}$  W., one-third of a mile from Berry Head, and a quarter of a mile off-shore; you cannot go between them and the land.

Mudstone Ledge, of  $4\frac{1}{2}$  fathoms, lies a mile S.S.W.  $\frac{1}{2}$  W. from Berry Head, and half a mile E. of Sharkham Point. The Mag Rock lies close under Sharkham Point.

The Druid's Mare is a small rock, 7 feet above low water, close to the land, bearing about S.W.  $\frac{1}{2}$  W. from Sharkham Point.

Nimble Rock, with  $3\frac{1}{2}$  feet over it, and steep-to, lies about one-third of a mile off-shore, a little S. of Downend Point. From it the Start light-house is in line with the E. Blackstone, and the N.E. tangent of Downend Point is on with the highest part of Scabbacombe Cliff. The Start light-house open E. of the E. Blackstone leads eastward of the rock, and the same open W., leads between it and the land.

Bootfield Rock, of 9 feet at low water, lies off the S.-eastern extreme of Downend Point, and about 2 cables from the shore. A projecting rocky point, half a mile to the southward, open of Downend, N.N.E.  $\frac{3}{4}$  E., leads to the eastward.

East Blackstone Rock, which is 10 feet above high water, lies a mile S.W. by S. from Downend Point. This rock is clear all round, with no hidden dangers.

Hopes Nose open of Berry Head, N. by E.  $\frac{3}{4}$  E., clears all dangers between Berry Head, and the Mewstone.

**DARTMOUTH HARBOUR** is about N.E.  $\frac{1}{2}$  E.,  $7\frac{1}{2}$  miles, from the Start and  $4\frac{1}{2}$  miles S.W. from Berry Head. Its entrance is between two high shores, being a large and secure harbour from all winds.

Dartmouth may always be known by the square steeple of Stoke Fleming Church, on the hill, a mile to the westward of the entrance, and by the Mewstone Rock, to the eastward of the entrance; also in hazy weather, when the points of land cannot be distinctly seen, Ittor Rock, which is on the top of Dartmoor, will serve to point out your situation.\* Vessels from the westward intending to call here should hoist a signal for a pilot when they arrive near off the Start. Pilots are always on the look-out, in two cutters, off the port.

\* Ittor Rock is a remarkable high mountain, lying about 11 miles to the westward of the entrance to Teignmouth, in latitude  $50^{\circ} 34'$ , and forms a most remarkable and useful object in approaching these parts, more especially in hazy weather; for being very high, it is distinguishable above the lower land, which at times is quite obscured from the lower mast-head. This mark brought to bear N.N.W. will lead up to Torbay.

**Beacon.**—On the eastern side of Dartmouth Harbour, on the high land, about 500 feet above the sea, at nearly half a mile N.E. by N. of the Outer Froward Point, a beacon 80 feet in height, built of grey granite in the form of a truncated pyramid, is erected, the better to distinguish the entrance to the harbour by day.

**Dangers on the Eastern side.**—The first danger on the eastern side of the harbour after passing the E. Blackstone is the Mewstone, 125 feet above high water. It lies about  $1\frac{1}{2}$  cable off-shore, and is steep-to on its eastern side. There is a channel inside, between it and the land, but it is dangerous to attempt.

The Verticals are a ledge of dangerous rocks, some of which show themselves at low water, extending parallel with the coast, one-sixth of a mile W. of the Mewstone. The West Rocks are the most western portion of the verticals, 400 feet further W., and dry at very low tides; and a cable's length further W. there is a rise of ground with only 24 feet water on it. Beacon Hill, on with Kingswear Castle, N.N.W., clears the tail of the Verticals, the Bears Tail, and leads inside the Old Castle Rock. In the day time E. Blackstone keep well open of the Mewstone, E.  $\frac{1}{2}$  N., will lead clear of all dangers off Dartmouth.

The Bear's Tail Rock lies out of the way of the proper track, rather more than half a cable S. of the Outer Froward Point, and dries at low water. The new Beacon Pyramid, bearing N.N.E.  $\frac{1}{4}$  E., will be in a line with it, and also lead to the westward of all the Verticals.

Old Castle Rock is a patch of sunken rocks upwards of a quarter of a mile westward of Outer Froward Point, with a good channel inside of it for small vessels. The inner head, called Old Castle Rock, has only 4 feet over it, the mark for which is the ruins of the Old Castle at Dartmouth (which stands at the southern end of the town) touching Battery Point. The outer head or Castle Ledge, of 8 feet lies nearly a cable's length S.W. of the inner head; outside the ledge, at half a cable's distance, a black buoy is laid down to mark its position. A mark to clear the ledge to the southward is the peak of the Mewstone open S. of the Shooter, a high detached rock just to the westward of Mewstone. To the westward keep the light-house at Kingswear N. by W.  $\frac{1}{4}$  W., open of Kettle Point.

**Dangers on the Western side.**— $1\frac{1}{2}$  mile W. of the Mewstone, on the opposite coast of the entrance, are the Combe Rocks, a group of rocks immediately off Combe Point, some above water, but all showing at low water. The outer rock lies rather more than a cable from the shore, and dries at half-tide. It has deep water all round it.

The Homestone is a dangerous patch of rocks lying a quarter of a mile E.S.E. of Combe Point, having a safe and deep channel between them and the Combe rocks. The shoalest part of the Homestone has not more than  $4\frac{1}{2}$  feet at low water. The marks for it are Kingswear Castle on with highest point of the Blackstone, N.E. by N.  $\frac{1}{2}$  N.; and a high and remarkable needle rock at Combe Point, in line with Stoke Fleming Church.

A buoy painted in black and white rings is moored about half a cable's length S.-eastward of the rocks.

**CLEARING MARKS.**—Kingswear Castle open E. or W. of the Blackstone, clears it on either side; and Stoke Fleming Church in line with the extreme of Combe Point leads to the southward.

N.E. of the buoy, 127 yards, there is a patch of 17 feet at low water. St. Petrox Church just open of Blackstone Point, N. by E., leads half a cable to the eastward.

**The Mag Rocks.**—These rocks lie a quarter of a mile N.E. by N. from the Outer Combe Rock, and show from half-ebb to low water. Kingswear Castle open of Blackstone Point, N.E.  $\frac{1}{4}$  N., leads eastward of these heads, and also of the Outer Combe.

The Pin Rock is right in the fairway of the entrance to Dartmouth; the least water upon it is  $4\frac{1}{2}$  fathoms at low water. It lies about one-third of a mile to the eastward of the Homestone. The cross-marks for it are, the E. Blackstone and S. point of the Mewstone in one, E.  $\frac{1}{4}$  S., and Dartmouth Castle flagstaff in line with a white house in the trees on Yarow Bank, N.  $\frac{1}{4}$  W.; the same house open of Battery Point leads to the eastward, and shut in with St. Petrox Church, to the

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westward ; but since the last examination the rock is not considered dangerous, except for large vessels at low water, with a heavy sea running.

**The Blackstone Rock** lies about half a mile N.E. by E.  $\frac{1}{4}$  E. from Combe Point, and a cable's length S. by E.  $\frac{1}{4}$  E. from Blackstone Point, and is 8 feet above high water, thus forming a useful mark for the entrance. There is a sunken rock lying about 70 or 80 eastward of its eastern point.

**Checkstone Rock.**—This is a group of rocks ; some of which are never covered, and most of them dry at low water. They extend a considerable distance from the shore, a little to the southward of Battery Point, the outermost having but a foot water over it. A black and white chequered buoy is laid down to mark its position, but there is as little as 13 feet water to the eastward of the buoy. Kingswear Point open of Battery Point, N.N.W., clears this spot to the eastward.

**Lights.**—There is a light-house erected on the northern or Kingswear side of harbour, near Beacon-hill House.

The light-house will exhibit a fixed light, showing white over the fairway entrance to the harbour through an arc of  $9\frac{1}{2}^{\circ}$ , between the bearings of N.  $\frac{1}{4}$  W. and N. by W.  $\frac{1}{4}$  W. ; red between N. by W.  $\frac{1}{4}$  W., and the land to the N.E., over the shoals of Kettle Point and Castle Ledge ; and green between N.  $\frac{3}{4}$  W. and the land to the S.W. over the shoals of the Checkstone and Pin Rock. The light is elevated 85 feet above high water, and visible 11 miles. The tower is octagon, 36 feet high, and stands about 150 feet southward of Beacon-hill House.

**Fairway.**—A fixed white leading light, at an elevation of 70 feet above high water, is also exhibited from a flagstaff at the distance of 110 feet seaward of the principal white light, which in line, bearing N.  $\frac{3}{4}$  W., will lead in the middle of the Fairway channel.

After passing between Castle and Kettle Points, a smaller white light near the coast-guard station, at the southern part of the town of Dartmouth, will indicate the fairway to the anchorage ; a red light will show over the shoals on the N. side of the harbour ; a green light over the shoal of the One Gun Point on the south.

**Marks for the Buoys.**—The black buoy marked "Castle Ledge," in  $4\frac{1}{2}$  fathoms, with St. Petrox Church in one with the centre of a grove on the back land, N.N.W. ; and a conspicuous double-pointed rock off Combe Point, in line with the house on Stadton Beach, W.  $\frac{1}{4}$  S.

The black and white buoy, in circular stripes, and marked "Home Stone," in 7 fathoms, with Kingswear Old Castle its breadth open E. of the Blackstone Beach, N.E. by N. ; and Stoke Fleming Church, its length down the slope of Combe Point, W. by N.

The buoy chequered black and white, and marked "Checkstone," lies in  $3\frac{1}{2}$  fathoms, at about 20 or 30 fathoms S.E. of the rock, with the southernmost house in Kingswear touching the point under St. Petrox, N.  $\frac{3}{4}$  W.

**The Range.**—Vessels coming from sea, and unable to fetch in, may safely anchor in the Range, in from 7 to 10 fathoms. When the wind is from S.W. to E.S.E., it blows right in ; but from the N.W. to the N.E., it blows out ; from all other points of the compass it blows in flaws ; hence it is very inconvenient to enter or leave the harbour without a leading wind, and should never be attempted, especially with a square-rigged vessel. A powerful steam-tug is said to be always stationed here, and can be engaged at moderate rates.

**TIDES.**—The tide of flood at the mouth of the harbour runs directly along the western shore, from the Homestone, through the Range, towards St. Petrox Point, and crossing the harbour there obliquely, follows the direction of the northern shore towards Kittery Point, whence it again crosses the harbour towards the town of Dartmouth. At the same time there is a strong eddy along the southern shore abreast of Warfleet Cove ; but little or no stream exists between St. Petrox Point, and Gun Point, either with flood or ebb. The ebb-tide crosses the harbour from point to point, causing a strong eddy between Kingswear and Kettle Points.

It is high water at 6h. 16m., full and change ; spring-tides rise 14 feet, neaps  $10\frac{1}{2}$  feet.

**START BAY.**—The Skerries.—From off Berry Head to off the Start the

course is S.W.  $\frac{3}{4}$  W., distance 12 miles. Between the entrance of Dartmouth and the Start Point is Start Bay. In this bay lie the Skerries, a dangerous bank of rocks and gravel, having on the S.W. end only 9 feet at low water. This shoal is about a mile in length, and above half a mile in breadth; its outer edge bearing E.  $\frac{1}{2}$  N., nearly a mile from the Start Point: it thence extends almost 3 miles in a N.E. by E.  $\frac{1}{2}$  E. direction, and terminates in a coarse sandy knoll, which is about half a mile long, and 230 fathoms wide, extending W. by N. and E. by S. with 14 and 15 feet on it. That part of the bank between the knolls has on it from 18 feet to 4, and  $4\frac{1}{2}$  fathoms.

The Skerries are steep-to, having 11 and 12 fathoms very near the outside, 9 fathoms near the inside of the S.W. end, and 7 fathoms near the N.E. end. Berry Head open of the Downend, bearing N.E.  $\frac{1}{2}$  N., will lead more than half a mile to the eastward of the shoal; and with Prawl Point open of Start Point, bearing W.  $\frac{1}{2}$  N., you will clear their S. side; or bring the Orestone open of Berry Head, and Bolt Head, open of Prawl Point, and thus pass the Skerries at a distance of about 4 miles. To clear the N.E. end of the Skerries, bring Street Church, on the highest part of Street-head Cliff, a little open of N. end of Slapton Beach, N.N.W.  $\frac{1}{2}$  W.

Mewstone open of high land on Downend Point, N.E. by E.  $\frac{1}{2}$  E., leads between the Skerries and the land.

The leading mark to sail through between the Start Point and the S.W. end of the Skerries in 9, 10, and 11 fathoms, is Widdicombe House (which is situated on the side of a hill, half a mile from the beach, and surrounded by trees) on with the easternmost house at Beesands, bearing N. by W.  $\frac{1}{2}$  W.

No ship in the night, or in foggy weather, ought to approach nearer to the N.E. part of the Skerries than the depth of 17 fathoms, or towards its S.W. end than 24 fathoms. There will generally be found a considerable swell of the sea over the shoal, and during a continuance of rough weather, the water breaks very high upon it. With south and westerly winds, small vessels frequently anchor in Start Bay, in from 5 to 8 fathoms. The beach is bold and the ground clean sand.

**START POINT.**—This prominent point may be recognised by its rugged appearance, and by the white granite light-house standing 140 yards inside of its S.E. extreme. There are five hillocks on the ridge within the light-house, each 200 feet above high water. Peartree Head at three-quarters of a mile W. of the point is 386 feet above the same level.

In the immediate vicinity of the Start Point there are the following dangers. To the S. and S.W. of the Point are the Peartree, the Start, and Cherrick Rocks, the two former are close to the shore; the latter lies S.  $\frac{3}{4}$  W., upwards of 2 cables from the point, and is awash at low water springs. There is also a sunken rock with 12 feet over it, S.E.  $\frac{1}{2}$  S., about the same distance from the light-house. To avoid this a vessel should not shut in the village of Hall Sands with Start Point until the Peartree Rocks open out S. of the Start Rocks, when by giving the latter a berth of about 2 cables she may shape a course to the westward.

**LIGHT-HOUSE.**—This is a handsome stone tower, 92 feet high, including the lantern, from which is exhibited a powerful revolving light, elevated 204 feet above the level of the sea, showing a bright flash every minute, visible 20 miles. In addition to this is a lower fixed light 192 feet above high water, in the same tower shown in the direction of Berry Head, illuminating an arc covering the Skerries Shoal, and extending between the bearings of S.W.  $\frac{3}{4}$  W. and W.  $\frac{1}{2}$  N., a faint continuous light from the lantern is seen within 10 miles. A fog-horn is sounded in foggy weather, giving one blast every three minutes. The revolving light is obscured when bearing to the southward of east by Prawl Point.

## DIRECTIONS FROM ST. CATHERINE'S POINT TO THE START.

The course from St. Catherine's Point, Isle of Wight, to the Start, is W.  $\frac{1}{2}$  N., and the distance 92 miles; this leads about 7 miles to the southward of Portland, in 26 to 30 fathoms, and from thence to the Start in from 30 to 36 fathoms.

From Portland to Berry Head, the course is W. by N., and the distance about 39½ miles, with a depth of water from 24 to 32 fathoms. In working down between St. Catherine's Point and Portland, stand off and on from 22 to 35 fathoms; but when to the westward of Portland, 30 to 36 fathoms.

Ships coming into the Channel often find hazy weather prevail, obscuring the face of the land so much, that it becomes either difficult or impossible to recognise any particular cape or headland, while the high mountains in the interior are distinguishable, and frequently well defined; on such occasion the Ittor Rock, on the height of Dartmoor, which was before mentioned, becomes an exceedingly interesting and useful object, as by bringing it to bear N.N.W., and steering in that direction it will conduct you towards Torbay.

**TIDES.**—Off St. Alban's Head, on full and change, the flood begins to make to the eastward at about 4 hours; half an hour after low water in Poole Harbour, while the ebb makes to the westward about 10 hours, or an hour after the first high water in Poole Harbour: between St. Alban's and Portland it makes to the eastward at about 3h. 45m., and the ebb to the westward at about 9h. 45m.; northward of the Shambles the flood makes to the N.-eastward at about 4h. 10m., and the ebb to the S.-westward at about 9h. 50m.; at the Bill of Portland the flood makes to the eastward at about 3h. 30m., and at about 4 hours the Race begins to rage, while the ebb makes westward at 10h. 15m., and the Race begins at 11h.; 2 miles westward of the Bill, the flood makes to the eastward at 4h., and the ebb makes to the westward at 10h. 30m., and further off at 5h. and 5h. 30m., while the ebb begins at 11h. or 11h. 30m.; off Lyme Regis the flood makes to the eastward at 3h. 40m., and ebb at 10h. 40m., and in Torbay the eastern stream ends at 8h., and in the offing at 9h., while on the southern side of the bay is an eddy, with all the eastern stream, and on the N. side of the bay, with the western stream, both round the bay; but outside of the Mewstone the western stream sets direct from Berry Head.

## FROM THE START TO PLYMOUTH SOUND AND THE EDDYSTONE.

**PRAWL POINT** lies W. ¼ N., 3 miles from the Start Point; and 2½ miles N.W. by W. from Prawl is the Bolt Head, which is remarkable high land.

**SALCOMBE HARBOUR.**—Between Prawl Point, and the Bolt head is the entrance to Salcombe, a bar-harbour; it is small, the entrance being rather more than a quarter of a mile across, and the land on each side very high. According to the survey of Captain Cox, R.N., 1859, there were 6 and 7 feet water on the bar; but in 1868 it was reported to have only 2 or 3 feet depth at low-water spring-tides; within the bar you will have 4 to 5 fathoms. From the westward, the harbour shows itself open; the land on the W. side of it appears rugged, and on the E. side gradually sloping. On the W. side of the entrance, off Bolt Head is a small island called the Great Mewstone, outside of which, at about half a cable's length, lies a ledge of rocks, one of which is called the Little Mewstone, over which the sea generally breaks. To these rocks you must give a good berth, leaving them on the port side. Pilots are generally on the look out off Salcombe, and strangers should not enter without one.

The harbour of Salcombe is now so perfectly beacons as to be easily and safely accessible to ships that can cross the bar at ordinary high water, when the sea is smooth.

The **RANGE** is the place of anchorage outside of Salcombe Harbour, but it is open to the southward. The best mark for anchoring is on the line of Woodville House on the Lambury Point, N.N.E., in 7 fathoms, sand and shells.

The **Rickham** is a small rock of 11 feet, lying a quarter of a mile off the eastern shore of the Range. Sandhill Cottage open of Lambury Point, or in one with the Road-bend, W of Salcombe Hill, N. ½ W., leads to the westward.



The Wolf and Blackstone are two rocks on the starboard side of the Channel, when over the bar; the former dries 1 foot, and the latter 11 feet.

The Poundstone and Old Harry are two similar rocks on the opposite or port side of the Channel, when over the bar; these rocks are beacons as under:—

Beacons.—On the W. end or tail of the Blackstone is a beacon with two red balls on a crosstree. On the Poundstone is a beacon, with one white ball. On the Old Harry is a beacon, with one white ball. These two latter rocks are on the W. side of the channel in, and covered at from 2 to 4 hours' flood.

Vessels entering the harbour, should keep the beacon with two red balls, on the tail of the Blackstone, on the eastern or starboard side; while the two beacons with single white balls must be kept on the port or western side; the deep channel flowing between the two red and two white balls. All the beacons have deep water and clean ground within a few fathoms of them; and the whole of the passage between them is of good depth, and not above 100 fathoms in breadth.

The harbour (completely land-locked) is one of the greatest beauty, and amongst the safest and most commodious in the English Channel; with ample room for 100 or 150 sail of ships to ride securely, in from 4 to 7 fathoms, good holding ground.

Directions.—The mark to lead over the bar, in the deepest water, keeping well over the western shore, is to steer in with Molt Point, on with a clump of trees in Northsand Bay, and also on the bend of a turnpike road on the W. side of Salcombe Hill, bearing N. by E.  $\frac{1}{4}$  E.

When over the bar bring the W. side of Fort Charles (ruin) in one with a thatched summer-house on Sandhill Point, N.E. by N.; this will lead up to the Roundstone when you must get the left side of Scoble Copse over the right side of Portsmouth Ferry-house, and it will lead between the Blackstone and Old Harry Rocks.

TIDES.—The flood sets round the Mewstone, directly over the bar, towards the Poundstone Rock, whence it crosses the harbour abreast of Fort Charles, and sets for the eastern shore as far as Woodville, thence it follows the trend of the shores.

The ebb sets out fairly, running nearly in the centre of the channel until abreast of Splat Cove, when it sets more to the southward. When on the bar, it sets directly out through the Range to seaward. It is high water, full and change, at 5h. 41m.; ordinary spring-tides rise  $15\frac{1}{2}$  feet, neaps  $11\frac{1}{2}$  feet.

The Bolt Tail lies N.W.  $\frac{1}{4}$  N., about  $3\frac{1}{2}$  miles from the Bolt Head; between them are the Gregory and Hamstone Rocks, of 9 and 10 feet water, about a quarter of a mile off shore. The first hummock (ruin of a signal-house) on Prawl Point open S. of Little Mewstone, off Bolt Head, E.S.E. leads to the southward of them.

Hope Cove, just to the northward of Bolt Tail, affords anchorage in 6, 7, or 8 fathoms, with S.E. and N.E. winds, but the ground is coarse.

At  $2\frac{1}{2}$  miles from the Bolt Tail is Borough Island, under which anchorage may be had with easterly winds on clean sand, from a half to 2 miles off, in 7, 8, 9, 10, or 12 fathoms. Round this island, to the eastward, you may land in a gale from the W. or S.W., safely, under some rocks, called the Merries: for the bridge of sand from the island to the main dries at half-ebb. Avon River is within—a place fit only for small craft. Should a vessel at this part have lost both anchors and cables, she may run in under the island, and, by giving a berth of about  $1\frac{1}{2}$  cable's length, save the lives of the crew, and perhaps both ship and cargo.

The WELLS ROCK, with only 5 feet water over it, lies N.W.  $\frac{1}{4}$  W.,  $1\frac{1}{2}$  mile from Borough Island, and is the most outlying danger on this part of the coast. It is half a mile from the shore between the Rivers Avon and Erme, and bears from Ringmore Church W., seen over the corner of a small sandy beach.

The shore between the Start Point and the Bolt Tail, being very steep and rocky, should be very carefully avoided; indeed, the coast from the Start to Stoke Point is all foul; but as none of the rocks lie further from the shore than half a mile, a ship of any draught may sail within a large half mile of the shore, except in Bigbury Bay, which throughout is rocky and dangerous; although colliers and small craft frequently enter the Erme River, which is about 3 miles to the N.W. of

Borough Island, on spring-tides, with a pilot. At 5 miles to the westward of this is the Yealm River, a place of safety for small vessels ; it lies S.E. from Cawsand Bay, and its entrance is  $1\frac{1}{2}$  mile eastward of the Plymouth Mewstone.

To sail in, keep half-way between the Mewstone and Yealm Point, and run in mid-channel, bringing up off the Passage ; or in cases of necessity, run on until aground on mud, where you will be safe from all winds.

In Bigbury Bay it is high water, full and change, at 5h. 40m.

**Stoke Point Rock.**—A dangerous rock of Stoke Head, eastward of the Mewstone near Plymouth : the bearings are, Maker Church a handspike's length within Reny Point ; and the bluff part of Stoke Head N.E. by N., 600 yards, or one-third of a mile. The base of the rock covers the space about a furlong ; it has only 8 feet on the shoalest part at low water, spring-tides, with from 11 to 7 fathoms all round it very close, and deep water from the inner part to 5 fathoms close in with the shore. The two stone conical beacons on the shore abreast of it, when in one bearing N.E. by N. point to the rock ; by keeping them open a vessel will pass clear of it on either side ; the town of Cawsand open S. of the Mewstone N. W.  $\frac{1}{2}$  N. leads outside it.

The Mewstone is a precipitous rocky islet, 194 feet high on the eastern side of Plymouth Sound, lying in a S.S.W. direction from Wembury Point, distant nearly half a mile.

**Mewstone Reef** runs out  $1\frac{1}{2}$  cable in a S.-westerly direction from the Little Mewstone, and is marked by a red buoy in  $7\frac{1}{2}$  fathoms, with peaks of the Great and Little Mewstone, in a line E.N.E. ; and S.W. end of Picklecombe Fort in Mount Edgecombe Park, touching N. side of Breakwater Light-house, N. by W.  $\frac{1}{2}$  W. ; and the flag-staff on Mount Wise in line with the inner edge of the Shagstone. The Shagstone on with the Breakwater beacon bearing North leads nearly 2 cables westward of the reef, clear of danger.

The EAST RUTTS is a ledge of sunken rocks, S.S.E., distant 7 miles from Plymouth Mewstone ; N.W. by W.  $\frac{1}{2}$  W. from Bolt Head, distant  $7\frac{1}{2}$  miles ; and W.  $\frac{1}{2}$  N.,  $4\frac{1}{2}$  miles from the Bolt Tail. On the shoalest part are 30 feet ; you then deepen suddenly to 7 and 10 fathoms, after which the soundings are more irregular, and increase to 20 fathoms at a little distance. These rocks are in the fairway of ships coming round Bolt Head, and bound for Plymouth Sound ; but they are not so dangerous as the Hand Deepes. That part where the shoalest water is, appears to be flat, and there is generally a very heavy ground-swell found on it. The marks for these rocks are, the first rise in the land within Prawl Point, seen half way down the Bolt Head, bearing S.E. by E.  $\frac{1}{2}$  E. ; Bigbury Church spire over the right extreme of the sandy beach in Challaboro Cove N.E. by E.  $\frac{1}{2}$  E. To pass them to the N.E. keep the top of the Mewstone in line with Maker tower, N.N.W.  $\frac{1}{2}$  W. ; and to the westward keep the Mewstone touching Reny Point, N.  $\frac{1}{2}$  W.

**EDDYSTONE LIGHT-HOUSE.**—This Light-house is 89 feet high, and is coloured red-and-white in alternate horizontal bands, and built upon a rock, bearing from Prawl Point W.N.W.  $\frac{1}{2}$  W., about 21 miles, and from Rame Head S.W. by S., southerly, 8 miles. It bears a fixed Light, 72 feet above high-water, and is brilliantly lighted with lamps and reflectors, visible 13 miles. A bell is sounded during foggy weather, five times in quick succession every half minute.

A small patch called the N.E. rock, lies E. by N.,  $1\frac{1}{2}$  cable from the Light-house, and uncovers 2 feet at low-water springs ; at half a cable outside or to the N.N.E. the depth is only  $3\frac{1}{2}$  fathoms. The other dangers extend S.W.  $\frac{1}{2}$  W., 240 feet ; S. by W., 500 feet ; and S.E.  $\frac{1}{2}$  E., 490 feet from the Light-house ; and the rocks at these extremes uncover from 3 to 7 feet. Close outside them the depths are 8 to 12 fathoms. Between Rame Head and the Eddystone are from 20 to 34 fathoms ; and to the westward, in the stream of the Eddystone, are 40 fathoms towards the Lizard.

High-water at the Eddystone at 5h. 5m. ; springs rise 15 feet, neaps 12 feet. It will be half-flood in Plymouth Sound before the stream off the Eddystone runs eastward. In the Channel the flood will continue till 9 o'clock.

**Hand Deepes.**—N.-westward of the Eddystone is a bed of sunken rocks, immediately in the fairway of ships coming from the westward, and bound into Plymouth

Sound ; the shoalest part is a pointed rock, having only 22 to 24 feet. This shoal has generally a ground swell on it, and with a S.W. gale and ebb-tide the sea runs very high, so that large ships should be careful to steer clear of it. The marks for these rocks are—the low S. part of Moor Hills in a line with the sharp top of the Mewstone, E. by N., and the Earl of Morley's park-gate (which appears like a white house, standing on the declivity under the highest part of Moor Hills), wholly in view eastward of the high land of Penlee ; or Mount Batten round tower is in line with Penlee Point. The park-gate house appears one-third up the hill from Penlee Point to Maker Church, and is very remarkable.

The following are the bearings and distances from the shoalest part of the Hand Deeps : Eddystone Light-house S.E. by S.  $3\frac{1}{2}$  miles ; Rame Head N.E. by E.  $\frac{1}{2}$  E.,  $7\frac{1}{2}$  miles ; Mewstone E. by N.  $10\frac{1}{2}$  miles ; and Bolt Head E.S.E., distant 21 miles. On passing to the westward of them, do not open Rame Church to the eastward of the barn on Rame Head until Wembury Church comes well open to the northward of the Mewstone ; and on sailing to the eastward of it, keep the Earl of Morley's park-gate (above mentioned) a sail's breadth open to the eastward of the low extreme part of Penlee Point ; or the Breakwater Light-house on with Mount Batten tower, N.E. by E.  $\frac{1}{2}$  E., leads to the S.E. of the Hand Deeps ; and the Light-house on with Penlee Point E. by N.  $\frac{1}{2}$  N., leads to the N.W. of them about a mile.

## PLYMOUTH SOUND.

**MAKING THE LAND.**—The marks to know the SOUND, when coming from sea in the day-time, are Rame Church, which stands to the northward of Rame Head ; and a square tower standing upon the highest part of the land over Penlee Point ; or by the land over Plymouth being double and very high ; or by Ittor rock, Dartmoor ; which being brought to bear E.N.E.  $\frac{1}{2}$  E., will lead directly to Rame Head, and you will pass sufficiently to the westward of the Hand Deeps, and make Rame Head ahead, and must haul to the eastward to round Penlee Point. On a nearer approach Rame Church will appear open to the northward of Rame Head, and Penlee tower and the Mewstone will be distinctly seen.

The entrance to Plymouth Sound is between the Mewstone and the Draystone, or between Reny and Penlee Points, being distant from each other  $2\frac{1}{2}$  miles. The Mewstones are two, the larger one lying about half a mile from Wembury Point, bearing S.S.W., and the Little Mewstone is just without it, having a shoal running from it W.S.W., nearly  $1\frac{1}{2}$  cable's length. The Reny rock is about one-eighth of a mile from Reny Point, and nearly a mile N. by W. from the Mewstones. On the outside of the Reny rock is a Shagstone, having 4 fathoms near its point.

**SOUNDINGS.**—One remarkable feature in the soundings on approaching Plymouth Sound is, that the depth of 20 fathoms at low-water extends along parallel with the shore, passing three-quarters of a mile outside Rame Head, the Mewstone, and Stoke Point ; and  $2\frac{1}{2}$  miles outside the Breakwater. Due notice, and particular observation of this, will materially assist in pointing out the vessel's position in thick and foggy weather.

**Light.**—THE BREAKWATER, constructed for the protection of shipping in the Sound, extends from the eastern extremity of the Shovel Shoal, westward, to a short distance northward from the Panther Shoal, so as to leave a narrow channel between it and the latter. On the western extremity of the Breakwater a Light-house is erected, from which a fixed light is exhibited, at an elevation of 63 feet above high-water, spring tides. The light will appear red in all directions to seaward, and will continue to the line of bearing of the Malampus, or Spile-buoy, or to N.E.  $\frac{1}{2}$  E. from the said Light-house, and shows a white light within that line, visible 11 miles. An additional light (bright) is seen 15 feet below the red one when the channel is open between the Draystone and Knap Shoal buoys, and when this white leading light is seen it should be kept in sight and steered for, being visible between N.E.  $\frac{1}{2}$  E., and N.E. by E.  $\frac{3}{4}$  E.

All vessels coming in by the western channel, are cautioned not to anchor until they have passed the line of the red, and opened the white light. A bell will be rung in foggy weather.

**Beacon.**—On the eastern end of the Breakwater is a conical beacon, bearing a mast with a ball on the summit. The mast has steps, and the ball is fitted to receive within it ten men in case of shipwreck; and near to each end of the Breakwater are two transit beacons, erected for the trial speed of steamers.

Near the middle of the Breakwater is a granite pillar, having a dial and brass plate, with the correct latitude and longitude engraven thereon, lat.  $50^{\circ} 19' 59''$  N. long.  $4^{\circ} 8' 52''$  W.

#### Description of the Shoals outside the Breakwater; Marks for the Buoys, &c.

The principal dangers in the lower part of the Sound outside the Breakwater are on the eastern side the Shagstone and Shagstone Ledge, the Tinker, and (for large ships to avoid) some rocky patches between the Tinker and the E. end of Breakwater. On the western side of the Sound, near the western end of the Breakwater, the Knap and Panther, and the Draystone off Penlee Point.

The Shagstone lies N.N.W.  $\frac{3}{4}$  W. from the Mewstone, and one-sixth of a mile from the rocky islet called Reny, and between the two latter is a detached reef of rocks, dry at low-water. The Shagstone is a small square-headed rock, about 9 feet above water, and marks the outer edge of a rocky ledge which bounds the shore between the Mewstone and Bovisand Bay. To the northward of the Shagstone this ledge extends half a mile from the shore for about the same distance, and is marked by two red buoys, the southern one of which is laid in  $4\frac{1}{4}$  fathoms, with the Shagstone on with the Peak of the Mewstone, S.S.E.  $\frac{3}{4}$  E., and the Breakwater beacon on with E. end of Hoe quarry, also on with the W. end of Leigham Terrace, Plymouth, N. by E.

The northern buoy is moored in 5 fathoms, with the Chapel on Rame Head, on with first hollow in the cliff N. of Penlee Point, W. by N.; and the Breakwater beacon on with the middle of Leigham Terrace, N. by E.  $\frac{1}{4}$  E.

The Tinker Shoal lies nearly S.W. by S. from the E. end of the Breakwater, is about a quarter of a mile E. and W., and one-eighth of a mile in breadth, with 15 to 20 feet over it at low water.

This shoal is marked by two white buoys, one at each end, E. and W. The western buoy is at the N.W. angle of the shoal, lies in 6 fathoms, with the Dockyard Chapel in line with Ravenness Point, N.  $\frac{1}{4}$  W.; the Breakwater beacon on with the E. end at Catdown quarry cliff, N.E.  $\frac{1}{4}$  N., and the highest peak of Reny Rock on with the right extreme of a small dark quarry on Wembury Point, S.E. by E.  $\frac{1}{4}$  E.

The eastern buoy, at the S.E. angle of the shoal, lies in 5 fathoms, with the Breakwater light-house on with the E. turret of Picklecombe Fort, N.N.W.; the house in Staddon high N. Battery on with the inner part of curve of Bovisand pier-head, N.E.  $\frac{1}{4}$  N.; and the highest part of Reny Rock on with the centre of Wembury Point Quarry, S.E. by E., easterly.

Some small rocky patches of 4 fathoms between the Tinker and Breakwater are marked by two chequered black and white buoys. The outer or southern buoy, near to which is 26 feet water, lies with the Shagstone on with the peak of Little Mewstone, S.S.E.; and the breakwater beacon in line with Citadel flagstaff, N. by E.  $\frac{3}{4}$  E.

The inner buoy has 25 feet near it, and lies with the Breakwater Beacon on with the Citadel flagstaff, N. by E.  $\frac{3}{4}$  E.; and the Breakwater light-house on with the Gamekeeper's Cottage, Mount Edgecumbe, N.W.  $\frac{1}{4}$  N.

The Knap and Panther are two shoals nearly connected, composed of sand and rock, having not more than 20 feet at low-water over some parts, with 5 and 7 fathoms between. These shoals lie S.W. of the W. end of the Breakwater, and are

marked by two black buoys, one at each end of the dangers. The southern buoy (the Knap) lies on the S. end of the shoal in 6 fathoms, with the Blockhouse on Devil's Point just open eastward of Ravenness Point N. by E.  $\frac{1}{2}$  E.; and the Breakwater beacon on with the S. extreme of Bovisand Coast-guard houses, E. The buoy of the Panther on the N. end of the shoal lies, in 7 fathoms, with Mount Wise flagstaff in line with W. extreme of Breakwater platform, N.  $\frac{1}{2}$  E.; the Breakwater beacon midway between Bovisand house and Hooke's house, E. by S.; and the Shagstone its own breadth open northward of the Mewstone, S.E. by S.

The Draystone projects nearly a quarter of a mile S.E. from Penlee Point, and is marked by a chequered red-and-white buoy, in  $5\frac{1}{2}$  fathoms, on its outer extremity, with Rame Head coast-guard mast on with the N. side of a remarkable gap in the cliff in Lillery Cove, N. W. by W.  $\frac{3}{4}$  W., and the W. side of the third fish-store from the northward, in Cawsand Bay on with Penlee high-water mark; Breakwater light-house, N.E. by E.  $\frac{1}{2}$  E.

Stand no nearer to the reef than to bring Stonehouse Hill fort on with Redding Point, N.E.  $\frac{3}{4}$  N.; this mark will clear well to the eastward of the Draystone.

The Draystone carries 11 feet at low water springs, between it and the point are 19 feet.

#### Shoals within the Breakwater, &c.

On the EASTERN SIDE OF THE SOUND, just within the Breakwater is the Duke Rock and Leek Bed; the Dunstone Rock near Dunstone Point: the Cobbler, Winter, Mallard, and Asia Shoals, the last four between Mount Batten and Drake's Island. On the western side the Queen's and New Grounds, and other shoals near Redding Point; the Melampus extending S.E. from Drake's Island; and the Bridge extending from Drake's Island to Reading Point; inside Drake's Island and near to the Victualling Yard on Bottlenose Point, is the Vanguard Rocks.

The Duke Rock and Leek Bed are situated to the N.-eastward of the Breakwater, the former, a little more than one-third of a mile from Staddon Point, and form one continued shoal. Near the western edge a white buoy is moored in 5 fathoms, one-third of a mile N.N.E.  $\frac{1}{2}$  E. from the breakwater beacon, with the bakery or E. chimney of the Victualling Yard on with the W. high-water extreme of the Islet lying off the N. end of Drake's Island, N. by W.  $\frac{1}{2}$  W.; and the S.W. corner of Hooke's House just seen southward of the Harbour-master's house at Bovisand, S.E.  $\frac{1}{2}$  E. The least water, 18 feet, is a short distance S.E. of the buoy, and there are 4 and  $4\frac{1}{2}$  fathoms between the shoal parts.

The Dunstone Rock is a rocky patch of 19 feet lying W., 2 cables from Dunstone Point; there are 4 fathoms water all round it. The marks are, Charles' Church, Plymouth, in line with the W. side of Fisher's Nose, N. by E.; and the Obelisk on Mount Edgumbe in one with the N. extreme of the fort on Drake's Island, N.W. by W.

The Cobbler Shoal is the rocky ledge extending from Mount Batten, and its outer end is marked by a black buoy in  $2\frac{1}{2}$  fathoms, with Devonport Monument on with the S.W. extreme of wall at Rusty Anchor, or W. Hoe Terrace Point, N.W.  $\frac{1}{4}$  W.; and Catdown tall chimney its own breadth open of the quay on Mount Batten Point, E.  $\frac{1}{2}$  N.; between the buoy and the shore there are 15 feet, but at half a cable N.E. from the buoy there are only 6 feet.

The Mallard is a rocky shoal 2 cables W. of Mount Batten and S. of the Citadel, and with the Cobbler lying directly at the entrance to the Catwater. The least water over it is 12 feet, and 5 and 6 fathoms around it. Its N.W. extreme is marked by a black buoy, in 7 fathoms, with Cawsand Coastguard houses just in sight over Redding Point, W. by S.  $\frac{3}{4}$  S.; and the Obelisk on Mount Edgumbe in line with apex of house in Western King Fort, W.N.W.  $\frac{1}{4}$  W.

The Winter Shoal, the least water upon which is 12 feet, lies nearly midway between Drake's Island and the Citadel Point. Between it and the Island there are not more than  $4\frac{1}{2}$  fathoms at low water; eastward of the shoal there are 10 to 18 fathoms. It is marked by three buoys, one on the N.W., striped red and white, in

[E. CHANNEL.]

4 fathoms; one on the N.E., chequered red and white, in 5 fathoms; and on the S., coloured red, in 3 fathoms, with the N. end of Cawsand Coastguard houses touching Redding Point, W. by S.  $\frac{1}{2}$  S.; and the chimney of Gill's Soap Factory just open westward of the lime-kiln, and over the E. end of the counting-house of W. Hoe Quarry. The two other buoys lie about three-quarters of a cable more or less N.E. and N.W. of the S. buoy.

The Asia Shoal is the N.-eastern extreme of the ledges extending from Drake's Island, and is marked by a white buoy, in 29 feet, with the N.W. and N.E. buoys of the Winter in line with Mount Batten flagstaff, E.S.E.  $\frac{1}{2}$  E.; and Mount Edgecumbe ruin on with the S.E. extreme of the Islet off N.W. end of Drake's Island, W.  $\frac{1}{4}$  S.

The Queen's Grounds.—ON THE WESTERN SIDE OF THE SOUND are the Queen's Grounds, some shoal patches of 3 to 4 fathoms, off Picklecombe Point, between that and the W. end of the Breakwater, about 4 cables' length from the latter. A red buoy is placed on these rocks in 5 fathoms, on their S.E. extremity, with Devil's Point Blockhouse in line with Redding Point, N. by E.  $\frac{1}{2}$  E.; and the peak of the Mewstone on with the Breakwater W. crane, S.S.E.  $\frac{1}{2}$  E.

The New Grounds have on their shoalest part about 29 feet, and marked by a red buoy, lying with the E. building-shed in Dockyard just open eastward of trees on Wilderness Point; the engine-house tall chimney in Dockyard just clear of Wilderness high-water point, N. by W.; and St. John's Church, Plymouth, on with retreating angle in Citadel wall, just within Fisher's Nose, N.E.  $\frac{1}{2}$  E.

The Bridge is the rocky reef which extends from Redding Point to Drake's Island, and carries 7 feet at low-water springs, and the channel is indicated by two beacon buoys, the southern one red and the northern one white. This channel is not fit, in blowing weather, even for small craft after half-ebb. The leading-mark through is, St. John's Chapel, Devonport, in line with the Blockhouse on Devil's Point, N.  $\frac{1}{4}$  W.

The Melampus is a rocky shoal stretching out S.E. from Drake's Island; it is marked by a black buoy, in about 4 fathoms, with St. Andrew's Church tower, Plymouth, touching the W. side of the Obelisk on the Hoe, N.E. by N.; and the Blockhouse on Devil's Point, touching the E. side of westernmost high-water rock of Drake's Island, N.W.  $\frac{1}{4}$  N.

The Vanguard and German Rocks are two rocky heads lying S. from Devil's Point; the Vanguard is much in the way of large ships, for it extends one-third across the channel from the point. The S. point is marked by a black mooring buoy, in 5 fathoms. The German, of only 2 $\frac{1}{2}$  feet, lies 146 yards from the Blockhouse on the Point, and out of the way of all but small vessels.

The Cremil Shoal is a spit running off Cremil Point, on the opposite shore to the Victualling Yard, and is marked by a black mooring buoy. The Breakwater Light-house open of Ravenne's Point, S.  $\frac{1}{2}$  W. leads eastward of this shoal.

The Rubble Bank, or Harbour Shoal, is a ledge of slate rocks, off the S.W. point of the Dockyard at Devonport, and stretches half-way across the channel. The Pollock rock, of 3 fathoms, is situated on the N.W. part of the bank, and the western end is marked by a black buoy. The S.W. angle of Winter Villa on with the N.E. angle of Brewery Store in Victualling Yard, S.E. by E.  $\frac{1}{2}$  E., clears the Rubble bank, to the southward, and the tower of Dockyard Chapel open N. of Master-Attendant's Office, N.E. by E.  $\frac{1}{2}$  E., leads to the northward.

Beacon on the Hoe at Plymouth, near the Citadel. This beacon is painted red-and-white, in horizontal bands, and in front of it is a Diamond Mark, on a rock; the two forming a leading-mark.

Harbour Lights.—At Mill Bay, where the Great Western Docks, are built and the Tidal Basin formed, a fixed red light is shown from the extremity of the southern pier on the eastern side of the bay.

At Sutton Pool, Plymouth, on the W. Barbican-pier head, is a fixed light, 29 feet above high-water, visible 13 miles.

*Plymouth Time Signals.*—The Mean Time at Greenwich is daily shown at 6 o'clock P.M., by the instantaneous collapse of a cone 4 $\frac{1}{2}$  feet in diameter, and

painted black, suspended near the top of the flagstaff in the Redoubt of Mount Wise, Devonport.

As a preparatory notice to the observer, at three minutes before one o'clock, the cone is expanded to its perfect shape : and at the instant of 1h. P.M. of Greenwich mean time it collapses. Again, at two minutes later, it is once more extended, and at the instant of 1h. 5m. P.M. it again collapses ; the second collapse is made in order to verify the first, or in the event of its not having been noticed by the observer.

The Time Signal is not made on Sundays. The position of the flagstaff on the Mount is latitude  $50^{\circ} 22'$ , longitude  $4^{\circ} 10' 15''$ , or 16m. 41s., W. of Greenwich.

**SUTTON POOL.**—There is a depth of 22 feet at high-water springs, between the pier-heads at Sutton Pool, but not more than 6 feet at low-water within the pier-heads, and the greater part of the bottom dries, being composed of soft mud. There are three ship-building yards ; two patent slips, and a dry dock on the shores of the pool. The latter is 265 feet long ;  $54$  feet broad ; 50 feet wide at entrance ; 16 feet over the sill at high-water, springs, and  $11\frac{1}{2}$  feet at neaps.

**MILL BAY** has a wet and dry dock, and Tidal Basin. The Wet Dock is 1260 feet long, and 450 feet broad ; 80 feet wide at entrance, 31 feet over sill at high-water springs, and  $26\frac{1}{2}$  feet at neaps. The Dry Dock is within the Wet Dock, and is 367 feet long, and 92 feet broad ; 80 feet wide at entrance,  $27\frac{1}{2}$  feet over the sill at springs, and 23 feet at neaps. The Tidal Basin at entrance of Wet Dock is protected by a pier from the E. side of entrance, within which is a pontoon pier for the accommodation of steam vessels ; the Tidal Basin has an area of 30 acres, with from  $2\frac{1}{2}$  to 14 fathoms in it at high-water springs, and  $1\frac{1}{2}$  to  $12\frac{1}{2}$  fathoms at neaps.

## DIRECTIONS FOR PLYMOUTH SOUND, HAMOAZE, AND CATWATER.

**EASTERN CHANNEL.**—This channel should never be attempted at night, nor at any time by large vessels, unless with a free wind or with steam. To sail through, the leading-mark is, the beacon on the eastern end of Plymouth Breakwater on with the red-and-white beacon upon the Hoe. This mark will lead you in or out in  $4\frac{1}{2}$  fathoms at low-water, about midway between the red buoys on the N.W. part of the eastern ledge, and the eastern white buoy of the Tinker, and chequered buoy on the S. channel rock, and also about 35 or 40 fathoms to the eastward of the other chequered buoy ; but you may, if necessary, sail on either side of the chequered buoys, and also through between them.

There is a channel of half a mile in breadth, through which large vessels may pass between the Tinker and Breakwater, and go round the E. end of the Breakwater to the Sound ; but none ought to venture that way without a pilot. The mark through is the N. tower of Staddon Fort and flagstaff in one. Wembury Point, seen to the southward of the Shagstone, leads to the southward of the Tinker, and a remarkable hummock on the acclivity of Stoke Point, in one with the N. side of the Shagstone, will carry you to the northward of the Tinker. Shagstone in line with north high-water end of Mewstone, S.E. by S., leads between the Breakwater and Panther, to the W. end of Breakwater.

**WESTERN CHANNEL.**—This channel is the principal entrance into the Sound, and the only safe one for large ships at all times of the tide, having plenty of water, and room to work in. Vessels from the eastward will first make, on their starboard hand, the Great and Little Mewstones ; to these they should give a berth of 2 cables' length, in order to avoid the foul ground which lies about them. Having passed these, they should keep the Bolt Head open to the southward of the Great Mewstone, proceeding westerly until the Breakwater Light-house comes in line with Mount Batten Tower, N.E. by E.  $\frac{1}{2}$  E. ; or should you be bearing up to the northward, in standing to the westward be careful not to pass the line of the north high-water point of the Mewstone in line with Stoke Point, S.E.  $\frac{1}{2}$  E., for this mark clear

the Tinker and Knap to the southward, and leads up to the mark previously noticed, the Breakwater and Mount Batten Tower in one. With this latter mark you may proceed to the N.-eastward, westward of the Knap and Panther shoals, and round the west end of the Breakwater.

Smaller vessels and steamers may take a narrow channel to the northward of the Panther, between that shoal and the western end of the Breakwater, by keeping the Shagstone in line with the north high-water end of Mewstone, S.E. by S., southerly. Having rounded the Light-house, haul more to the eastward, and choose your anchorage. You may anchor, if requisite, with either of the following marks—Drake's Island N.W. by N., in 6 fathoms; Mount Edgecumbe House open to the southward of Drake's Island; Mount Batten N.E. by N., and Plymouth old Church touching the W. corner of the citadel; but vessels may anchor much further out, being protected, in S.-westerly gales, by the Breakwater; but it is not recommended, the former being the recognised anchorage for merchant vessels.

Vessels from the westward having passed Rame Head (the ground near which is rocky) must, in proceeding eastward, keep the tower or square part of Rame Church in sight over the land, coming no nearer to Penlee Point than one-third of a mile, or than the depth of 9 or 8 fathoms. The mark to clear the Draystone to the southward, is the Ball Beacon on the E. end of the Breakwater, open N. of the white-washed mark on Bovisand Pier, until the light-house on the Breakwater comes on with Mount Batten Tower.

In beating into the Sound keep the north high water point of Mewstone in line with Stoke Point S.E.  $\frac{1}{4}$  E., by which you will pass to the southward of the Knap and Tinker, until you have worked into Cawsand Bay, where you may stand into the depth of 6 fathoms, but not to shut the W. end of Drake's Island in with Redding Point; and towards the Knap and Panther, tack before the tower of Mount Batten comes on with the Breakwater light-house, and when well to the northward of the light-house, stretch to the eastward into the Sound, to the Merchant anchorage.

In Cawsand Bay, the best anchorage with the wind to the S.-westward is with Penlee Point S.W. or S.W. by S.; Cawsand Town N.W.; Bolt Head in one with the Little Mewstone; and Plymouth New Church open of Redding Point. Coasters sometimes go between the Draystone and Penlee Point, a narrow passage, with from  $1\frac{1}{2}$  to  $3\frac{1}{2}$  fathoms within it.

To sail into Plymouth Sound in the night, bring the Eddystone light to bear S.W.; and steer N.E., according as you have the wind and tide. Keep in this direction until the water shoals to 13 or 12 fathoms: you will have this depth about three-quarters of a mile from Penlee Point, which shore is by far the safest to run in by in the night-time, or in thick weather; or when in the depth of 13 or 14 fathoms, so soon as you can see the red light at the Breakwater, bring it to the N.E. by E.  $\frac{1}{4}$  E., and sail directly towards it, until the white light is seen, which leads in the channel between the Draystone and Knap Shoals. You must be careful to keep your lead going, and to come no nearer to Penlee Point than 9 or 8 fathoms, for in this depth you will not be more than half a mile from the shore, and with the point bearing W.N.W. you will be above the Draystone.

To Sail into Hamoaze westward of the Winter Rock, it will be necessary with a large vessel to wait until half or two-thirds of the flood-tide has made. In this channel are 4 fathoms at low water springs, between the Winter and Asia Shoals. Gill's Soap Factory chimney ranged from end to end of W. Hoe Terrace marks the limits of the channel between the Winter and Asia, and this channel is most frequented, except at dead low water. Keeping the towns of Cawsand and Kingsand open of Picklecombe Point, W.  $\frac{1}{4}$  S., clears the ledges on the S. side of Drake's Island, until the S.W. angle of Mill Bay Hotel is in line with the S.W. angle of Stone-house Hill Fort N. by W.  $\frac{1}{4}$  W.; this mark leads through between Drake's Island and Winter Rock, leaving the Asia buoy on the port hand, until the Western King Fort-house on Devil's Point comes in one with Cremil Obelisk W.N.W. westerly; this mark leads N. of Drake's Island Bank, and when *S.W. angle of the W. Hoe Terrace comes in line with S.E. angle of Esplanade*



E.N.E.  $\frac{1}{2}$  E., it will lead between Drake's Island and Devil's Point to the southward of the Vanguard.

When Mount Wise comes well open of Devil's Point, N., steer over towards the battery on Mount Edgecumbe, to avoid the eddy tides; then steering towards Mount Wise, take care to avoid the shoal extending off Cremil Point, by keeping the Breakwater light-house open of Redding Point, about S.  $\frac{1}{2}$  W.; or the flagstaff on Mount Wise in line with cupola of St. John's Chapel, N., leads between the Cremil and Devil's Point, and when the N.E. angle of Brewery Store in line with the S.W. angle of Winter Villa, S.E. by E.  $\frac{1}{2}$  E. comes on, you may steer westward S. of the Rubble Bank. When Maker Church bears S. by W., and comes open of the western house in Imfracombe, on the W. part of Mount Edgecumbe, you may anchor, or run up the harbour.

**The Bridge.**—St. John's Chapel cupola, Devonport, exactly in one with the tower on Devil's Point, N.  $\frac{3}{4}$  W., will carry you over the Bridge, and through the passage between Drake's Island and Redding Point, now marked by two beacon buoys in the deepest water; 22 feet at high water springs; but only 7 feet at low water.

To sail into Hamoaze eastward of the Winter Rock, keep the mark for clearing the ledges S. of Drake's Island on as before, until the red and white beacon on the Hoe is in one with the white diamond-mark under the Hoe, N. by E.  $\frac{1}{2}$  E., steer thus, leaving the Winter buoys on the port-hand, and the Mallard and Cobbler on the starboard; keep the latter mark on until you get the mark which leads in the fairway N. of Drake's Island—viz., the Western King Fort-house and Cremil Obelisk in one, W.N.W. westerly, then proceed as before.

The great difficulty with sailing vessels proceeding into or out of Hamoaze is the tides, particularly between Devil's Point and Cremil Point; even in steam-vessels great caution is necessary, and, if possible, should be avoided during the strength of the tide.

Both the ebb and flood tides in this passage run with considerable velocity, particularly across the Bridge, which makes it necessary to pay strict attention to the marks when sailing either in or out. Should the wind fail, and the ship not steer in the tide-way, let go an anchor in time, and bring up in Barn Pool, where will be found 16 or 17 fathoms, and good ground.

Warping buoys are moored all the way from the Asia buoy to Hamoaze, which you may make fast to when the tide is too strong to proceed.

**CATWATER.**—The entrance to Catwater lies between Mount Batten and Fisher's Nose; the latter being the name of the point under the S.E. angle of the Citadel.

To sail into Catwater, you should run between the Winter and Cobbler buoys, the mark being Fisher's Nose in line with the spire of St. John's Church, Plymouth, N.E.  $\frac{1}{2}$  E., until Ravenness ruin comes between Drake's Island's Barrack's, W.  $\frac{1}{2}$  S.; you will then have passed to the eastward of the Mallard, and may, by keeping the latter mark, steer eastward, leaving the greater part of the channel on the starboard side, so as to avoid the shoal water off Mount Batten, and you will have 4 fathoms, until abreast of Gun Point, the eastern point of Sutton Pool; then Plymouth Old Church in one with the western pier-head light-house will lead to the anchorage off Catdown in from 3 to 5 fathoms, secured from all winds, and in very little tide. From Gun Point to Bear's Head are from  $2\frac{1}{2}$  to 2 fathoms; it then deepens to  $2\frac{1}{2}$ , 3, and 5 fathoms off Catdown, in any of which depths you may anchor.

To sail between the Mallard and Winter, steer as for the Hamoaze, until Ravenness ruin comes between Drake's Island Barracks; this will lead to the northward of the Mallard, and proceed eastward as before.

Plymouth may be considered the best port in the Channel to run for in a storm, or in case of distress, having two entrances as well as two inner harbours, in both of which ships may be run on the mud should they have lost their anchors; those from the westward may proceed to Catwater, and those from the eastward to Hamoaze. The light at the W. end of the breakwater renders Plymouth easy to

access by night as well as by day. Pilots may always be obtained by making a proper signal.

**TIDES.**—On the full and change, it is high water at Plymouth Sound 5h. 37m.; at Hamoaze and Catwater, 5h. 40m.

In Plymouth Sound the rise and fall of the tides are greatly dependant on the winds; thus a S.S.W. wind commonly makes the highest floods and lowest ebbs, while northerly winds effect the contrary. In extraordinary cases, spring-tides will have a rise of 18 feet, but generally not more than  $15\frac{1}{2}$ , while neaps may rise to 11 or 12, but with northerly winds seldom more than 6; in general there will be a difference of 4 feet between the rise of an ordinary spring and neap tide, and the same difference in their fall at low water, but in extraordinary tides a difference of 6 feet.

### PLYMOUTH PILOTAGE.

No master is compelled to take a pilot within this district, unless going in or coming out of the port within a line drawn from the Mewstone to Rame Head; but if he does take a pilot between the Start and Looe, it must be one of the district pilots.

Ships anchoring in either Cawsand or Plymouth Sound are to pay only half pilotage.

There are thirty-two Trinity house pilots belonging to the port, and their limits are from the Start to Looe.

### FROM PLYMOUTH TO THE LAND'S END.

The bearing and distance from Rame Head to the Dodman are W.  $\frac{1}{2}$  N., 22 $\frac{1}{2}$  miles. From Rame Head to the entrance of Falmouth Harbour is W.  $\frac{1}{4}$  N., 33 miles, and from Rame Head to the Lizard, W.  $\frac{1}{4}$  S., 44 miles.

**WHITESAND BAY**, to the westward of Rame Head, is much exposed to S.W. gales. Near the western part of the bay is **PORT WRINKLE**, about 5 miles eastward of Looe. It is a small pier harbour, affording shelter for fishing boats. Three beacons show lights at night when the boats are at sea.

**SHERBETERRY ROCKS.**—In a line from Rame Head to Looe Island, which will be N.W. by W., within 2 $\frac{1}{2}$  miles from the latter, and 2 miles from the shore is the outermost of the Sherbetry Rocks, these rocks consist of several rocky patches of 4 $\frac{1}{2}$  fathoms. The mark for the outer patch is the Day Mark on Gribben Head open of Nealand Point, W. by N.  $\frac{1}{2}$  N. The Mewstone on with the extreme of Rame Head, bearing S.E. by E.  $\frac{1}{2}$  E., leads three-quarters of a mile S. of the Sherbetry Rocks, and clear of all dangers between Rame Head and Polperro.

**LOOE.**—About 3 leagues N.W.  $\frac{1}{2}$  W. from Rame Head is the entrance to Looe; this harbour is small, and dries at low water, and is frequented by coasters and fishing-boats. The tide runs up the river about 3 miles. With high springs there will be 13 feet over the bar, and with neaps about 6. Observe in coming from the westward, and going round Looe Island, to be careful of the Rennies Reef, which runs out half a mile to the S.-eastward of the island; to avoid which, bring the slated storehouse at Downend Point just open S. of the Orestone, W.N.W.; this will clear a cable's length to the S., and when you open Looe Church, haul in; but the river requires a pilot. Looe Island lies to the southward about a mile, and bears from Polperro E.S.E.  $\frac{1}{2}$  E., distant 3 miles, and from Rame Head N.W. by W., 8 $\frac{1}{2}$  miles. In Looe Bay you may anchor with W.S.W. and westerly winds, in 3 $\frac{1}{2}$  fathoms, clear ground, abreast of the house, the marks being Orestone Point touching the inside of the island, and Looe Church, open of the cliff, at the port entrance of Looe River. At high water and spring tides there will be sufficient water for a vessel of 10 feet draught between the island and main. Springs rise 16 feet, neaps 13 feet, high water, full and change, at 5h. 26m.

**UDDER ROCK.**—About 4 $\frac{1}{2}$  miles W.  $\frac{1}{4}$  N. from the N.W. part of Looe Island, and about half a mile from the shore, is a sunken rock, called the Udder, about 80 feet

in length, and 20 in breadth; it is visible 2 feet at low water, spring-tides; there are 6 fathoms within it, and near its outside are 4 fathoms. The mark to clear this rock is, the Orestone on with the N. extreme of Looe Island. This also clears the Larrick Rock, which lies W.,  $1\frac{1}{2}$  cable from Nealand Point, and covers at last quarter-flood.

POLPERRO is a fishing-town, having two small piers; its entrance being between two high hills, is difficult to find. Lantivet Bay is to the northward of the Udder Rock about a mile.

FOWEY lies about  $7\frac{1}{2}$  miles to the westward of Looe Island, and about 3 leagues N.E. by E.  $\frac{3}{4}$  E. from Dodman Point. It may easily be known by the narrowness of its entrance, and the high land on each side. The entrance is a little more than a cable's length across; on the W. side stands St. Catherine's Castle and an old windmill, and on the E. side are the ruins of St. Saviour's, and old church. In the best of the Channel are not more than 3 fathoms at low water. You may anchor opposite to the town in 3 fathoms, but near to Polruan, on the E. shore, you will have only 12 and 15 feet. As this harbour lies about N.E. by E. and S.W. by W., it has a better outlet to the westward than many others on the southern coast of England; and in cases of necessity vessels may enter it without cable or anchor, and run on shore abreast the town on soft mud, floating again when the tide rises.

TIDES.—It is high water here, on the full and change days of the moon, at 5h. 4m.; and the water rises on spring-tides nearly 15 feet, and neaps  $11\frac{1}{2}$  feet. The ebb-tide runs an hour after it is low water by the shore, and is always stronger than the flood.

There is good anchorage outside the Harbour, in from 5 to 10 fathoms. With the tower of Fowey Church over St. Saviour's Point, and the three points to the eastward open, you will have good anchorage, in 7 or 8 fathoms, fine sandy bottom. If you anchor in deeper water than 10 fathoms you will have foul ground.

THE CANNES ROCK.—The danger to be avoided in entering Fowey is a ledge of rocks, called the Cannes; they lie about a quarter of a mile S.E.  $\frac{1}{2}$  E. from the Day Mark on Gribben Head, and may be seen at half-ebb. Between these rocks and the point are only 10 feet water, and the ground all over is foul. The mark to clear the Cannes is Dodman Point open outside the Gwineas Rock, or Gorron Rock, sail's breadth within Dodman Point, until the spires of Fowey Church come in sight.

GRIBBEN HEAD.—A Day Mark is erected upon Gribben Head to the westward of the harbour of Fowey; this tower is 250 feet high, is painted with red and white horizontal bands, and stands upon an elevation of 257 feet above the level of the sea; the headland is thus rendered easily distinguishable from St. Anthony's Head, at the entrance of Falmouth, or any other point upon that part of the coast.

There is a small cove on the port side, as you run in for Fowey, called Predmouth Cove, having a shingly landing beach.

THE GWINEAS ROCK lies about  $2\frac{1}{2}$  miles E.N.E. from Dodman Point; and three-quarters of a mile from the shore; it is a black stone, always above water; small vessels sometimes are seen going between it and the shore.

Between Fowey and the Dodman are two large bays, Mevagissey, and Tywardreath and St. Austell, which may be considered one bay.

POLKERRIS HARBOUR is round Gribben Head, in the N.E. part of Tywardreath Bay, and S.E. three-quarters of a mile from the entrance of Par. It is a very small place, open to the westward, and sheltered from that quarter by a pier on its S. side. The harbour is dry at low water; springs rise  $14\frac{1}{2}$  feet, neaps 10 feet.

PAR HARBOUR, situated also in the N.E. of Tywardreath Bay, is a much larger place than Polkerris. and protected by two piers\* 125 feet apart at the entrance,

\* The above-mentioned pier or breakwater was constructed by J. T. Austin, of Fowey, who writes, that at Par, "if a vessel can live in the sea, be the wind what it may, she can always get out; and when out, having so much sea room, she has nothing to impede her progress. Her departure is insured by a buoy, about 70 fathoms S.S.E. from the pier-head. Another great advantage arises from the position of the pier-head, to run behind which, vessels are in no danger, let the sea be ever so rough."

and will accommodate 30 vessels of 100 to 200 tons. There are 14 feet at springs and 10 at neaps. The sand dries  $1\frac{1}{2}$  cable S.S.W. from the entrance, and as far out as the Callyvardor Rocks, which lie S. by E.  $\frac{1}{2}$  E., one-third of a mile from the outer pier-end. These rocks have an iron beacon erected upon them, and cover at one-third flood.

CHARLESTOWN HARBOUR is situated on the northern part of St. Austell Bay, and is formed by two piers, and is capable of accommodating 15 to 20 vessels of 150 to 200 tons. There is a small tidal basin at its head, and the sand dries 200 feet from the entrance at lowest tides. There are 14 feet at high water and 10 at neaps, over the sill of the basin. There is a shipwright's yard, dock slip, and rope walk, offering every facility for repairs. It is high-water at 5h. 15m.

There is good anchorage in all parts of St. Austell and Tywardreath Bays; but should the wind be strong from the eastward, it is recommended to anchor under the eastern land about half a mile from Polkerris, in 4 or 5 fathoms, until the weather moderates; on the contrary, if the wind is from the S.W., then to anchor near to Charlestown, about a quarter of a mile from shore. A good look-out is kept by the pilots, and masters of vessels may depend upon having assistance directly an opportunity offers for coming into the port of Charlestown. To the southward of Black Head, which is the S. point of St. Austell Bay, are some spots of foul ground, and round which we come to Mevagissey Bay.

PENTUAN TIDAL BASIN, in Mevagissey Bay, is on the eastern side of the beach, a little more than a mile from Black Head. The entrance is by gates 25 feet wide, and the sill  $2\frac{1}{2}$  feet above low water. A pier to the southward, running out in a S.E. direction, protects the gates. Depth of water 14 feet at high water springs, 10 at neaps. The sands dry a cable's length from the entrance, and a warping buoy is moored in  $11\frac{1}{2}$  feet at low water, about  $1\frac{1}{2}$  cable S.E. from the pier.

MEVAGISSEY is another small harbour of similar construction to the former, and carrying the same depth. A large mackerel fishery is carried on here during the season.

Chapel Point forms the S. Point of Mevagissey Bay, and S.  $\frac{1}{2}$  W. from which, at  $\frac{1}{2}$  of a mile distance, is the Gwineas rock, 26 feet above high water, ordinary spring-tides, and appears black; and another a little to the eastward, called the Yaw rock, which dries 3 feet at the lowest tides. Gorran Haven, where there is the remains of a pier, lies W.S.W. from the Gwineas rock. The ground for about a quarter of a mile to the eastward of Chapel Point is foul. Between the point and Gwineas rock are 3 and 5 fathoms. Chapel Point is very low land; round it to the northward,  $1\frac{1}{2}$  mile, is good anchorage, in 7 or 8 fathoms, bringing the point to bear S.S.W., half a mile from the shore. It is high water at 5h. 4m.; springs rise  $15\frac{1}{2}$  feet, neaps 12 feet. Neither Polkerris Bay nor Mevagissey Bay are much frequented, unless by small vessels.

To the westward, off Gorran Haven, you may anchor with the winds from W.S.W. and N., in 5 or 6 fathoms.

DODMAN POINT is a high and bluff headland, appearing double, with a round hill sloping towards the W., elevated 363 feet above the level of high water. From the Dodman, Penare Point or Nare Head bears W.  $\frac{1}{2}$  N., distant  $4\frac{1}{2}$  miles; St. Anthony's Head W. by S.,  $9\frac{1}{2}$  miles; and Black Head, S.W. by W.  $\frac{3}{4}$  W., 17 miles.

Round the Dodman Point is VERYAN BAY, in which, with easterly winds, you can anchor on clean sandy ground, in 6, 7 or 8 fathoms, half a mile off shore, bringing Dodman Point to bear S.E. by E.

LATH ROCK.—About  $2\frac{1}{2}$  miles from the Dodman is a little rock, called the Lath, lying with the S. side of Porthlooe Cove N.W.  $\frac{1}{2}$  N., distant a mile; Gerran's Village in line with the extremity of Penare Point, W., a little southerly; and the Dodman E.  $\frac{1}{2}$  S. It has 7 feet water upon it, and round it 5 and 6 fathoms; a little within it are 10 fathoms, and between it and the Dodman 12 fathoms.

Porthlooe is a fishing cove, W.N.W. from the Dodman, where you may land at half-flood between the rocks, which are nearly under the houses.

PENARE or NARE HEAD is a bold headland 260 feet above high water, to the S.E. ~~are the~~ are the Gull and Whelps rocks

The Gull rock lies 6 cables E.S.E. from Penare Point, is 125 feet above high water, and a quarter of a mile from the nearest shore. There is a passage between the rock and the land, with 20 feet at low tide.

The Whelps lie in a S.W.  $\frac{1}{4}$  W. direction from the Gull, and are detached rocks. The highest Whelp is 3 cables distant from the Gull, and covers at three-quarters flood. The middle Whelp is  $1\frac{1}{2}$  cable from the Gull; and there is a small rock which covers at quarter-flood, S.W., 100 feet from the highest Whelp. Pendowa limekiln open W. of Penare Head, N.N.W.  $\frac{1}{4}$  W., leads westward of the Whelps; and Porthlooe flagstaff open S.E. of the Gull, N.E.  $\frac{1}{4}$  N., leads to the S.E.

GERRAN BAY is about 3 miles to the eastward of St Anthony's Head, the eastern point of entrance to Falmouth Harbour; it is sheltered from W. and N.W. winds. There is a small town and landing-place at Porth Scatho, with off-shore winds; the ground in some parts is clean.

**Bizzies Shoal.**—Between Gerran Bay and the entrance to Falmouth is Killygerran Head, and a mile N. of Killygerran Head is Greeb Point, off which shoal water extends in a S.-easterly direction  $3\frac{1}{2}$  to 7 fathoms, nearly a mile, when it terminates in a shoal of  $3\frac{1}{2}$  fathoms, called the Bizzies. Twewince House open W. of Roseteage House, N.W.  $\frac{1}{4}$  N., leads westward; the same house open E. of Roseteage, N.W. by W.  $\frac{1}{4}$  W., westerly leads eastward; and the white coastguard house open S.E. of the Gull rock, N.E. by E.  $\frac{1}{4}$  E., leads to the southward.

**FALMOUTH.**—The entrance to this harbour is 2 miles to the westward of Killygerran Head, and lies between St. Anthony's Point on the E. and Pendennis Point on the W., and is about a mile wide, with the Black rock dividing the channel, but being situate more to the westward of the entrance. The harbour is excellent and capacious, being situated on a convenient part of the coast with respect to the Western Ocean, and is chiefly used as a port of call and for shelter.

**ST. ANTHONY'S POINT**, on the eastern side, is 204 feet above the sea, and is remarkable and bold, having an old signal house on the summit, and a light-house on the extreme of the western cliff. Pendennis Point, on the western side of entrance, is equally remarkable, being surmounted by the castle, which is 233 feet above high water; from point to point the bearing is N.W. by W. and S.E. by E.

**Light-house.**—On St. Anthony's Point is an octagonal white tower, exhibiting a revolving light at an elevation of 72 feet above the level of the sea at high water spring-tides, first visible in coming from the eastward on a N.W.  $\frac{1}{4}$  N. bearing, round seaward, and up to the harbour of Falmouth; appearing in a quick but regular succession of brilliant flashes every 20 seconds, and may be seen for more than 13 miles off. A fixed light, 37 feet below the revolving light, is exhibited to clear the Manacles rocks; it is seen only between the bearings of N.N.E.  $\frac{1}{4}$  E. and N. by E.  $\frac{1}{4}$  E., and when in sight leads 2 cables eastward of the rocks and buoy of the Manacles. A bell is struck every alternate half minute in foggy weather.

A **GREEN FIXED LIGHT** is shown at the end of the Prince of Wales' Breakwater, at three-quarters of a mile to the northward of Pendennis Point; this light is visible about 3 miles.

**Tidal Harbour.**—The above mentioned breakwater forms the eastern side of the new Tidal Harbour. It is 1400 feet long, and has a depth of 22 feet alongside the wharves at low water spring-tides. The west breakwater 1,100 long has 18 feet. These breakwaters or piers enclose an area of 42 acres, having an entrance 500 feet wide, facing the N.E. The depth in its northern part, and in the channel leading to it from Falmouth harbour, is 18 feet at low water, or 34 feet at high water springs.

**Docks.**—On the southern shore of this new harbour there are to be five graving docks, two of which are completed. The largest of these docks is 400 feet long and 65 feet wide at entrance, having 17 feet over the sill at high water springs; the other is 350 feet long and 50 feet wide at entrance, and has  $14\frac{1}{2}$  feet over the sill at high water springs. There is also a gridiron erected to the eastward of the graving docks, 170 feet in length, and having 13 feet on it at high springs. To the westward of this tidal harbour, it is proposed to construct a floating dock to embrace the extent of 14 acres, with an entrance from the tidal harbour 80 feet

[E. CHANNEL.]

in width. When this is carried out, there will be 29 feet water over its sill at spring, and 25 feet at neap tides, and this harbour will be connected with the South Western Railway system to London. The whole of these docks will be about half a mile to the eastward of the town of Falmouth.

**Rocks and Shoals.**—**OLD WALL.**—In approaching Falmouth from the eastward, you will pass the Old Wall, or Pinnacle rock, a small rocky shoal, having only 27 feet on its shoalest part, which is of conical shape, and so small that should a ship touch upon it, the first swell of the sea must inevitably heave her off again; it lies  $1\frac{1}{4}$  mile due S. from St. Anthony's Point, and the marks for this shoal point are, the Greeb Point, showing east of Killyerran Head, bearing N.E.  $\frac{1}{4}$  E.; and Restronguet Smelting Chimney (a long way up the harbour, on the western side) in line with the eastern end of the broken rocks off St. Anthony's Point, bearing N.  $\frac{1}{2}$  W.

Between the Old Wall and St. Anthony's Point, are several patches of 4 and  $4\frac{1}{2}$  fathoms, extending south more than half a mile from shore, causing a ripple or overfall with flood-tide and S.E. winds.

**Black Rock.**—Nearly in the middle of the entrance, and almost opposite to Pendennis Castle is the Black rock: it appears at half-tide, and has a stone beacon upon it, to mark it when overflowed by the tide. This rock is surrounded by a shoal to the distance of a cable, northward and westward, having 1 to 3 fathoms upon it; while on the eastern side the shoal extends S.E. by E.,  $1\frac{1}{2}$  cable, having 3 fathoms, and S.S.E.,  $1\frac{1}{4}$  cable from the beacon, having  $2\frac{3}{4}$  fathoms upon it. S.W. by S. from the beacon at the distance of  $1\frac{1}{2}$  cable there is a detached shoal of  $2\frac{3}{4}$  fathoms, and between that and the rock  $3\frac{1}{2}$  and  $3\frac{3}{4}$  fathoms. There is a channel on either side of the Black rock, but that on the eastern side is the best, where there is a depth from 6 to 18 fathoms at low water.

**Lugo Rock** lies three-quarters of a mile to the northward of St. Anthony's Point light-house, and one-sixth of a mile S.S.W. of St. Mawe's Castle. It is uncovered 2 feet at the lowest tides, and is marked by a black buoy 50 yards S. of the rock. The mark for it is St. Mawnan Church just seen north of the beacon on the Black rock W.S.W.

**ST. MAWE'S BANK**, on the eastern side of the harbour, extends from St. Anthony's Point as far as Turnaware Point, and at half a mile N. of St. Mawe's Castle it stretches nearly half way across the channel. This elbow is called the Vilt, is steep-to, and marked by a black buoy. A black buoy is also moored on the edge of this bank, on the eastern side of the Narrows, about one-third of a mile N.W.  $\frac{1}{2}$  N. from the Castle.

**FALMOUTH BANK.**—A similar flat to the former extends from Pendennis Point to Mylor Point, on the western side of the channel. Its outer edge, nearly opposite St. Mawe's, forms the western side of the Narrows, and is marked by a white buoy, which lies opposite the first black buoy of St. Mawe's Bank. These two buoys are called the east and west buoys of the Narrows; and at 2 cables' length to the westward of the white buoy, and between that and the entrance to the New Docks, are two Dock buoys, lying north and south, three-quarters of a cable apart, the northern one coloured red-and-white, and the southern one red.

On the eastern edge of the Pendennis bank, N.E.,  $\frac{1}{2}$  N., half a mile from Pendennis Point and in line with the point and the white buoy of the Narrows, is a chequered black-and-white can buoy, moored a short distance to the eastward of the Governor, a shoal patch of 2 fathoms on the Pendennis bank; this buoy lies about 60 yards E. by S. from the rock, in 15 feet at low water spring tides, with the E. end of Falmouth Dock Breakwater touching the pier-head at Flushing, N.N.W.  $\frac{1}{4}$  W.; the Black rock beacon, S.  $\frac{1}{4}$  E., distant half a mile.

**CARRICK ROAD** lies between the banks just described; the best anchorage is in the northern part, in from 13 to 15 fathoms, the channel being 320 fathoms wide, lying nearly N.  $\frac{1}{2}$  E. and S.  $\frac{1}{2}$  W.; here is the usual anchorage for men-of-war. Hence it turns round to the Cross Road, nearly E. by N.; where it is 300 fathoms wide, with 12, 13, and 14 fathoms. In St. Just's Pool it becomes narrower, being only from 140 to 100 fathoms wide, with from 15 to 14 fathoms in it, and continues *the same breadth to  $1\frac{1}{2}$  mile above Mesack Point, whence it becomes still narrower*

and shallower. This channel is winding and narrow, and the tide at springs sets across it, running commonly  $1\frac{1}{2}$  knot.

At St. Just's Pool vessels perform quarantine if requisite. Truro lies about 5 miles from Turnerware Point. It is high water at Falmouth, at 5 hours F. and C.; spring-tides rise 16, and neaps 12 feet.

**OUTER ROAD.**—From St. Anthony's Point towards the Manacles there is a good anchorage, with the mouth of the harbour open, in what is called Falmouth Outer Road. By bringing Budock Church (which is about a mile to the west of Falmouth town), in line with the centre of Swan Pool, Sandy Bay, N.W. by N.; and for the eastern mark—Penare Head open of Killygerran Head E.N.E., you will have 12 or 13 fathoms good ground.

In all westerly winds, but particularly during the summer season, ships of the line, and men-of-war in general, having occasion to call at this port for their supplies, will find it more convenient to anchor outside the points of Pendennis and St. Anthony, than to become entangled with the interior anchorage of Carrick Road, or St. Just's Pool, from either of which it would be difficult to get to sea in blowing weather, with the wind anywhere in the S.E. quarter.

It is therefore recommended that no ship, in using this outward berth, should anchor more to the eastward than to bring St. Mawe's Pier in a line with Carrick-nath Point; or to the westward than Mesack Point in one with the Black Rock; and on either mark from half to not further than 2 miles from the shore, or not further off than will just open Penare Head on the one side, or bring Budock Church over the middle of Swan Poolsand Bay on the other; by doing which you will be sure to anchor on a bottom clear of rock. By any position taken within the space thus marked out, you may, on the wind getting to the eastward, and rendering it an unsafe anchorage, either proceed to sea with little trouble, or run into the harbour for security, the entrance to which is by these means kept open.

Ships should never go further to the westward for anchorage than by bringing Mylor Point a little open to the eastward of Pendennis Point.

## DIRECTIONS FOR SAILING INTO FALMOUTH HARBOUR.

To sail through the **EASTERN CHANNEL** for Carrick Road, bring Penarrow or Mylor Point on with Killaganoon house, bearing about north; this will lead clear between the banks through Carrick Road, leaving three black buoys on the eastern side, and a chequered and white buoy on the western, until you bring the Observatory (on the rising ground at back of Falmouth town) just open S. of Falmouth Church, bearing W. by S.  $\frac{1}{2}$  S.; this mark leads through the Cross Road into St. Just's Pool; St. Keverne Church will then be seen to come on with Pendennis Point, S.W.  $\frac{1}{2}$  S., which passes through the pool; and when nearly up with St. Just's Creek on the starboard hand, steer to the N.N.W., until Restranguet western ferry-house comes on with Restranguet Point, which keep on, and you will bring Mylor and Pendennis Points on with each other; this will carry you mid-channel until you get Trelissick-house showing clear of High Cliff at Trelissick Point; proceed with this mark on until you are near Turnerware Point, off which a shelf of gravel stretches nearly half-way over the channel, and must be carefully avoided; the direction of the river will then be your guide further, keeping nearly mid-channel.

In dark weather it will be proper to give St. Anthony's Point a berth of 2 cables' length, running in with the land of St. Mawe's, a point open of the starboard bow; or steer for Mylor Point, passing St. Mawe's, keeping your lead going, and taking care not to get into less than 9 or 8 fathoms.

To sail through the **WESTERN CHANNEL**, bring Feock House in one with Mylor Point, bearing N. by E.  $\frac{1}{2}$  E.; this mark will carry you over Falmouth Flat at half-tide in 5 fathoms. Frigates may pass through the Western Channel *sa* at half-flood, but should not attempt it at low water. Vessels will sail in free

the wind at N.W. by W. on the port tack ; and should the high land of Pendennis cause the wind sometimes to baffle, there will be no danger if you have passed the Black Rock.

**Anchorage in Carrick Road.**—When St. Mawe's Castle bears S.E., you will have passed the Narrows, and entered Carrick Road, and may proceed to anchor. If with S. or S.-easterly winds, it will be advisable to bring up with the small bower, in 12 or 13 fathoms, rather inclining to St. Mawe's Bank, and moor, with your best bower toward Falmouth Bank, in 12 fathoms ; but with the wind to the westward of S., bring up with your best bower in 12 or 13 fathoms, more inclined to the Falmouth Bank, mooring with your small bower towards St. Mawe's, in 12 or 13 fathoms. The upper part of the road is considered the best.

Cross Road is safe, and has more room. Here let go your anchor, so that you moor open to the southward ; bring up with your best or small bower in 10, 12, or 14 fathoms, and, when moored, have the sheet-anchor cleared to let go, should the ship, in very heavy gales, or sudden squalls, either start or bring home her anchors. Ships frequently drive by dropping their anchors too near the banks.

**St. Mawe's Creek.**—There is also good anchorage for small ships in this creek, in about 2 fathoms ; but, in sailing in, care must be taken to avoid the Lugo Rock. To avoid it to the southward, bring Mawnan Church tower on with the Black Rock beacon ; having passed it, steer for St. Mawe's pier, and anchor before the town in the before-mentioned depth.

St. Mawe's town or village is situate on the northern shore of St. Mawe's Creek, just to the eastward of the Castle. To take the anchorage of Falmouth on the western side of the harbour, you must round the white buoy of the Narrows, and steer to the W.N.W., which will give the deepest water, from 3 fathoms to  $2\frac{1}{2}$  and 1 fathom off the town of Flushing, on the northern shore of Penryn Creek. This little town is situate opposite the northern part of Flushing ; and  $1\frac{1}{2}$  mile above which is the town of Penryn, where, at high water springs, vessels may proceed to, if not drawing more than 12 feet. This is a larger place than Flushing, and at the quay there is generally a depth of 6 feet.

To sail out of Falmouth Harbour, large vessels should get under sail at the latter part of the flood, or a little before high water, and before half-ebb they would be clear of the harbour, and more than half-way towards the Manacles. Vessels have occasionally worked out under double-reefed topsails, and passed the Manacles in one tide, the wind blowing hard.

Bound out of Falmouth to the westward, the course to clear the Manacles with an ebb-tide and a scant wind, is S. by E., and with a large wind, S., for about 4 leagues ; from the entrance of Falmouth, they bear about S.S.W.  $\frac{1}{4}$  W., 6 miles.

The Manacles lie  $5\frac{1}{2}$  miles S.S.W.  $\frac{1}{4}$  W., from Pendennis Point, and are 3 miles, S. by E. from the entrance of Helford Sound ; they require a good offing, and lie nearly a mile from the shore. These rocks are high, and not a bad object to confirm the situation of Falmouth, and are dangerous in sailing from Falmouth with easterly winds and ebb-tides, the latter setting strongly upon them. To go clear of them, keep Mawnan Church well open of Nare Head, N. by W. until you bring the Lizard light-house open of Beast Point, W.  $\frac{3}{4}$  N., and the contrary when sailing towards Falmouth.

About N.E. by E. from the outer Manacle Rock, distant  $\frac{1}{2}$  a mile, is a small rock, under water, having only 5 feet over it ; this lies with the only slated house in Porthoustock, nearly N.W.  $\frac{1}{2}$  W. ; the above mark of Mawnan Church, open of Nare's Head, will just lead to the eastward of it.

**Buoy.**—A bell buoy, painted black, with staff and globe, and marked with the word "Manacles" upon its head, is placed in  $18\frac{1}{2}$  fathoms at low water, spring-tides, 56 fathoms S.E. from the outer sunken rock at the eastern extremity of the Manacles Ridge ; Mawnan Church Tower, on with Nare Point, N.  $\frac{3}{4}$  W. ; Black Head, W.S.W. ; St. Keverne Church spire N.W. by W.  $\frac{1}{4}$  W. ; and St. Anthony's light-tower N.N.E.  $\frac{3}{4}$  E.

In coming from the westward by night, the Lizard lights kept in line bearing W. by N., northerly, will lead about  $3\frac{3}{4}$  miles to the southward of the Manacles ;



when St. Anthony's light bears N.N.E.  $\frac{1}{2}$  E., steer for it. It is to be observed that the eastern part of the Lizard land hides the light in approaching within  $1\frac{1}{2}$  mile of Black Head.

The following directions are also given for vessels outward bound, and caught with strong westerly gales off the Lizard :—

Falmouth Bay and the Outer Roads can be entered at all times, now that a light-house is erected on St. Anthony's Point, and are in many respects preferable to Torbay, or any in the Channel. Steam-vessels, and also others with a leading wind, can enter the harbour at night with perfect safety, by attending to the following directions:—Ships when off the Lizard at night, and wishing to bear up for Falmouth Harbour, the Bay, or Outer Roads, should steer E.N.E., keeping the Lizard lights in sight until Falmouth harbour-light bears N.N.E.; then steer directly for it, and run in until you are within  $1\frac{1}{2}$  or not more than 2 cables' length from the light, then steer N. by W. about a mile, or to where the green light of Falmouth Dock Breakwater bears N.W.; this will take you to the eastward of the Black Rock, up to the three-fathoms, or Falmouth Bank; and should you wish to anchor in Carrick Roads, steer from thence N.  $\frac{1}{2}$  E., until you fall into 16 fathoms. When St. Mawe's Castle bears S.E., or the centre of Falmouth town lights bears W. by N., you will have entered Carrick Roads, and may anchor.

For the outer anchorage, see p. 83.

## THE COAST WESTWARD OF FALMOUTH.

**HELFDORD.**—The entrance to the River Helford lies about 4 miles W.S.W.  $\frac{1}{2}$  W. from St. Anthony's Point, and leads up to Helford, Constantine and Gweek. When going into or out of this harbour, keep in the mid-channel, or rather nearer to the S. shore, because the ground, to a little distance from the N. shore is foul, with the Gedges lying off.

The GEDGES is a small patch of dangerous rocks that dry at low tides, lying S.W.  $\frac{1}{2}$  S.,  $4\frac{1}{2}$  cables from Rosemullion Head, and quarter of a mile off shore, with Mawnan Church N.W. by W. Inside the Gedges, and between them and the reef off the land is a narrow passage of 12 feet water, but having a sunken rock on the western side just awash at low water. Due south from the Gedges at half a mile distant, and N. by E. from Nare Point, is a small spot of 18 feet.

On the S. side of the entrance there is a steep point, and on the N. side a low flat point. Being within Mawnan Point, you may anchor by bringing Mawnan Church to bear E.N.E., and ride in from 4 to  $3\frac{1}{2}$  fathoms. Helford town lies about 2 miles from the entrance of the harbour, and Gweek  $3\frac{1}{2}$  miles further up. A little to the eastward of the town is a bar on which are only 15 feet; the best water over it is nearer to the S. than the N. shore; off Helford in mid-channel are  $4\frac{1}{2}$  and 5 fathoms, but close to the town it is shallow. Small vessels only frequent this place; and the entrance is to be known by Mawnan Church on the N. side, and Little Dennis Castle on the S. side. If it should be low water, drop anchor opposite Durgin until half-flood; then run over the bar, and anchor off the Passage, keeping near mid-channel; you will be safe from all winds.

There is a small river, called Gillans, on the port hand, as you enter Helford Sound, where small craft may lie safely sheltered.

About  $1\frac{1}{2}$  mile S.W. by S. from Nares Head is Porthalla Cove, off which you may anchor with W. and N.W. winds, in 8 fathoms, stony ground, about half a mile from shore, with the Manacle Point bearing S., distant  $1\frac{1}{2}$  mile. It is right under St. Keverne Church; at its further end is a clean shingly beach, where in case of urgent necessity a vessel may run on shore at an hour's ebb. It flows at 5h., F. and C.; springs rise about 18 feet.

Porthoustoe is another cove, to the northward of the Manacles. Between the Manacles and the shore is a passage to those who are well acquainted with this part.

and it may prove no bad refuge for any one who may have had the misfortune to run on the Manacles, some of which are dangerous; you will find 8, 9, and 10 fathoms between the Manacles and the shore, but a number of rocks lie off the point, rendering the passage westward of them dangerous. On Manacles Point is a signal-post. When leaving Falmouth steer S. by E. until you get Beast Point (just to the eastward of the Lizard light-houses) open of Black Head, when you may keep more to the westward.

A signal station-house, 30 feet high, and signal staff has been established on Beast Point, about three-quarters of a mile E. of Lizard light-houses, with which shipping can communicate by signal and forward advices.

To the westward of the Manacles, the shore bends inward towards Coverack, where small vessels may anchor with the wind from W. to N., having  $4\frac{1}{2}$  fathoms. Here is a small pier, which will contain about thirty coasters, well sheltered from southerly, westerly, and N.-easterly winds. On Black Head is a signal-house. To the westward is Cadgwith Cove and village, having a good sandy beach and landing-place at any time of the tide, with the wind from S.W. to W. and N.E. A small rock called the Bo, lies close in shore at eastern side of entrance and covers at half-flood.

**The LIZARD and Dangers adjacent.**—The Lizard Head is a bold precipitous headland, and is well known in the English Channel navigation as a point of departure, and is frequently made when homeward bound. It may be seen when the weather is clear at a distance of 24 miles, and is easily recognised by the two white light-houses upon it. With the assistance of these light-houses, either in day-time or at night, you may approach the head with confidence, bearing in mind that the dangers extend nearly half a mile off the point in the vicinity.

**Lights.**—The light-houses erected on the Lizard are each 61 feet high, and the buildings are octagonal, white, bearing W. by N., northerly, and E. by S., southerly, 74 yards apart; they are respectively 229 and 232 feet above high water, and exhibit fixed lights, visible 21 miles. When in one these lights lead  $3\frac{1}{2}$  miles to the southward of the Manacles, and the same distance southward of the Wolf Rock, but you must get a sight of them from the lower rigging, 30 feet above the sea, if you desire to use them for such dangers. It is high water at the Lizard at 5h. 10m., but off the Lizard, 10 or 12 miles, the stream continues to run till nearly 7h. 45m.

**Fog Signal.**—A siren trumpet fog-signal has been established at the Lizard, which will give one blast every 5 minutes, during thick or foggy weather.

The Stags Rocks lie off the Lizard Point to the extent of nearly half a mile, with 5 to 9 fathoms close to them. They are of several names: that to the westward is called the Mulvin, and is covered at high springs, and bears W. by N. from the light-houses, distant two-thirds of a mile; then the Man-of-War, the Carligga and the Maenheere to the S.-westward and southward of the head; these two latter cover at three-quarters flood. The Maenheere bears S.W.  $\frac{1}{2}$  S., nearly half-a-mile from the light-houses. The Ermach lies nearly  $1\frac{1}{2}$  cable N.-eastward of the Maenheere, and covers at half-flood.

The Vrogue is a dangerous rock, lying 4 cables S.E. from the Beast, having only 6 feet water over it. Three Beacons, painted red, are erected on the land to point out its position; one beacon is on the Balk, and two others on the Beast Point; the latter are 8 feet high, and 96 yards apart. The Balk beacon, in line with the extreme of Hot Point, N. by W.  $\frac{1}{2}$  W., leads a cable's length N.E. of the Vrogue; the Polpear Point open of the Bumble, W.N.W., leads to the southward at the same distance.

The Sperran Shoals are some rocky patches lying eastward of the Vrogue, having 5 fathoms upon them. From the outermost patch the Lizard light-houses bear W. by N.  $\frac{1}{4}$  N. The top of West light-house, just showing to the left of the *E. light-house*, marks the E. part of Sperran Shoals; and Treleague House seen open of the West brow of Cadgwith Cove, bearing north, marks the same.

*Craggan Rock* is a small rock, with 5 feet over it, lying S.  $\frac{1}{4}$  W., nearly two-thirds of a mile from Cadgwith Cove, with Beast Point bearing S.W. by W.,

nearly a mile ; and Treleague House in line with the western face of the entrance to Cadgwith. Another small rock, called the Va, lies off Perran Vose Cove, distant nearly 2 cables S.E.  $\frac{3}{4}$  E. from the extreme of the Balk, and covers at 3 feet flood.

**CLEARING MARK.**—Lowland Barn (on Lowland Point, just W. of the Manacles) open of Black Head, N.E. by E., clears all the rocks off the Lizard to the eastward.

The Boa is a shoaling of the bottom to 6 fathoms, N.W. by W.,  $2\frac{1}{2}$  miles from the Lizard Point, with some casts of 9, 10, and 13 fathoms. With S.W. gales the sea breaks upon these shoals, but there is no danger.

**Anchorage.**—Several anchorages are to be found about the Lizard Point, especially for small ships. Of these the Carthillian, is under Old Lizard Head, about a mile to the N.-westward of the light-houses ; the anchorage is in 5 fathoms. Here you may stop an ebb-tide, with the wind from the N.E. to E.S.E., you will ride over a bottom of clean sand half a mile from the Stag Rocks, and sheltered by them, especially at low water.

Just at the E. side of the Stag Rocks, and nearly under the Lizard lights, is Housel Bay. You may anchor in the middle of the bay with the wind from N.W. to N.E., in 6 fathoms, clean ground, bringing the outermost Stag W.S.W., distant three-quarters of a mile.

There is also a bay which lies round the Hot Point, N.E. of Housel Bay, where, with W. or S.W. winds, vessels may anchor in 6 or 7 fathoms, clean ground. The marks for it are, Landewednack Church tower just appearing over the W. side of the cove ; and Hot Point, S.S.W.  $\frac{1}{2}$  W. ; but beware of the Vrogue Rock.

In coming from the westward and intending to round the Lizard to the N.-eastward, do not steer to the eastward of S.E. with ebb-tide until you are a mile to the southward, and eastward of the outer rocks.

To clear the Stags Rocks on the western side, bring Godolphin Hill, which is 532 feet in height (on the N.E. coast of Mount's Bay), seen to the westward of Pednecrifton Point, N.  $\frac{1}{2}$  W. ; but in running to the N.-westward round the Lizard, do not haul in to the northward, nor shut in Black Head until you bring Mullion Island (4 miles N. of the Lizard) open of the land ; for although the shore is bold, those only acquainted should venture within three-quarters of a mile of the land. Therefore, having cleared the Stags by the above mark, keep at least that distance from the land in making for Mullion Bay.

**MULLION ISLAND.**—Pednecrifton Point, as already noticed, is about 4 miles to the northward of the Lizard, and a quarter of a mile N.E. of the Point is Mullion Island, 118 feet in height, and precipitous on the W.N.W. side. There is good anchorage on its N.W. side, in strong easterly or S.-easterly gales, in about 10 fathoms water, with the Island bearing S.  $\frac{1}{2}$  E., and Mullion Church E.  $\frac{3}{4}$  S. : but be ready, if the wind gets to the westward, to get away.

**PORTH LEVEN.**—This is a tidal harbour, frequented chiefly for China Clay (used in our potteries), copper, tin, and the fish of the locality, while its imports are timber and coal. It is situated about  $8\frac{1}{2}$  miles to the northward of the Lizard, and the entrance is 240 feet wide, and formed between the end of the pier and the Deazle Rocks, which cover at  $2\frac{1}{2}$  feet rise at springs. There are 6 feet at low water ordinary springs, at the entrance, and from thence the bottom inclines, and at the gate sill, some 960 feet within the entrance, there are  $13\frac{1}{2}$  feet at high water springs, and 10 feet at neaps. The entrance is directly open to the westward, and barks of timber are lowered to protect the gates, if required. The town at the harbour is called Torleven.

**LOO POOL.**—About a mile to the southward of Porth Leven is Loo Pool, the entrance of which is sometimes mistaken for the port. It is a large deep inlet of retained water, for the entrance to it is blocked up by a bar of shingle, 34 feet above low water springs : between this pool and Porth Leven the coast is low ; but more to the southward the cliffs vary from 50 to 200 feet in height ; the shore continuing sandy. A rocky patch called the Viziers lies N.W. by N., nearly 2 cables from Pedngwinion Head, and about a cable from the shore, and awash at low water springs ; and another rock awash at low water in a W.N.W. direction, about 2 cables from Pradamack Point.

**MOUNT'S BAY** lies to the N.-westward of the Lizard. Ships bound up channel, and meeting with strong easterly winds, may run in on the N. side of Mullion Island, and anchor near the shore in 8 fathoms. Bring the island to bear S.  $\frac{1}{2}$  E., and you will ride safely with the wind from N.E. to S.E. There are several places fit for anchoring on the E. side of this bay; one of them is to the northward of Gunwalloe's Cove, where you may anchor in 7 fathoms, about a mile to the southward of Loo Bar, northward of which the ground is good, and clear from rocks; and off Port Leven there is good anchorage in 11 fathoms, hard sand. The marks to anchor in this place are, Helston Church, N.E. by E.  $\frac{1}{4}$  E., and Cuddan Point, N.W. In all these places you may anchor with easterly winds; but from Porth Leven to St. Michael's Mount the coast is so foul and rocky that large ships should take care not to go into less water than 14 fathoms. The tides take different directions on the E. side of this bay.

**Dangers in Mount's Bay.**—The dangers in Mount's Bay, after rounding the Lizard Head and proceeding to the northward towards Penzance, are numerous, and requires a person to be well acquainted to handle a vessel along this coast, and which should, as before observed, be avoided by large vessels. We shall enumerate the dangers from the eastward.

**Great Row Shoal** lies S.W.  $\frac{1}{4}$  W.,  $1\frac{1}{2}$  mile from Rincey Head, and S.W. from the beacon on Trigoning Hill, and has 3 fathoms foul and uneven ground. Madron Union on with the R.C. Chapel at Penzance, N.W. by N., leads S.W. of this shoal: and Trigoning Hill open eastward of Trewavas farm-house, N.E., leads S.E.

**Welloe Shoal** lies upon the same bearing from the head, about two-thirds of a mile distant; one part of which dries 5 feet at low water springs.

The **Iron Gates** is the outermost of the shoals off Cuddan Point, and is a small patch of 4 fathoms, lying S.W. by S.,  $1\frac{1}{2}$  mile from the point.

**Carn Mallows Shoal** consists of several patches of 3 and 4 fathoms, lying S.  $\frac{1}{4}$  W., 1 mile from Cuddan Point, and nearly W. from Rinsey Beacon.

**Mountamopus Shoal** is  $1\frac{1}{2}$  cable long, and nearly a cable broad, having 5 ft. on its shoalest part. It lies about three-quarters of a mile to the S.W.  $\frac{3}{4}$  S. of Cuddan Point, and half a mile N.W. from the shoalest water of the Carn Mallows. A black buoy marks its S.W. edge.

The **Stones Shoal** is to the N.-eastward of the two latter, about midway between them and the land, and dries at two different spots at low springs.

**Bear's Rock** lies in the northern part of the bay formed by Cuddan Point and the Greeb, and covers at two-thirds flood.

The **Greeb Rock** is 24 feet above high water, and nearly a quarter of a mile from the shore, and has a detached rock off it; being separated from the main by large masses of rock.

**CLEARING MARKS.**—Trigoning Signal Hill open eastward of the Town of Trewavas, N.E.  $\frac{1}{4}$  N., clears all the shoals off Cuddan Point to the eastward; and Ludgvan Church in line with the Mount Tower, N.  $\frac{1}{4}$  E., clears the same to the westward. Between the Iron Gates and the Carn Mallows, and Mountamopus Shoals there is a good channel of 6 and 10 fathoms; the mark to lead through is Roger's Tower, in one with Mount Tower, N. by W.

The sea breaks heavily on the Mountamopus, Carn Mallows, and the Stones, in bad weather, with the wind S.S.E. to W.

**MOUNT ST. MICHAEL**, in the northern part of the bay, is of a conical form, 263 feet high, and about a mile in circumference; and has on the northern side a small harbour formed by two piers. This harbour is in extent about  $2\frac{1}{2}$  acres, and carries a depth of 11 feet at high water springs, and  $7\frac{1}{2}$  feet at neaps. The entrance is 124 feet wide, and has 16 feet at high water ordinary springs, and 12 feet at neaps.

**Guthen and Maltman Rocks** lie to the N.W. of the Mount, and are much in the way approaching the harbour. The Maltman is the nearest to the Mount, and lies S.W.  $\frac{1}{4}$  S. from the Castle about a cable off-shore, and is awash at low-water. The Guthen is upwards of a cable off-shore in a W.N.W. direction from the Castle, and has only 10 feet over it.

**Hogus Rocks** are to the N.W. of the Channel to the harbour, and cover at three-quarters flood.

The **Bloon** or **Raymond Rocks** are in the northern bight of the bay, and cover at one-third flood, and marked by an iron beacon, painted red, surmounted by a ball.

The **Cressar** are similar patches to the westward; the westernmost also marked by an iron beacon, painted red, with a ball.

South of the harbour of Penzance, on the western side of the bay, there are the **Battery Rocks**, extending a cable's length S.S.W. from the southern arm of the S. pier of Penzance Harbour, and the

**Gear Rock** in the same direction, and a similar distance from the former, with a channel of 4 fathoms between. The Gear has an iron beacon upon it, lies upwards of 4 cables S. by W.  $\frac{3}{4}$  W. from the light-house, and covers at one-third flood.

The **Carn Base Rock**, with only 4 feet water on it, lies S.S.W.  $\frac{3}{4}$  W., seven-eighths of a mile from the Gear Rock, and one-third of a mile from the shore. The marks for it are, St. Paul's Church Tower in line with the southern side of the longest hedge bearing W.  $\frac{1}{4}$  S., and Trithal engine-house on with the eastern chimney of the coast-guard house, North.

**Low Lee Rock**, which also has only 4 feet water over it, lies one-third of a mile eastward of Penlee Point, and is marked by a red buoy, 30 yards eastward of the rock. The marks for the rock are, the extreme cliff at Penzer Point, in one with the northern hummock of St. Clement's Island, S.W.  $\frac{3}{4}$  W.; and the tower of St. Paul's Church in line with the southernmost new barn, W. by N.  $\frac{1}{2}$  N.

**PENZANCE HARBOUR** is in the N.W. bight of Mount's Bay, and is formed by two piers; the northern pier runs out 572 yards in a southerly direction; the southern pier has been extended to the eastward, and a stone light-house is erected on its extremity. The harbour has an extent of 31 acres, and there are three building yards, and a dry dock, capable of repairing vessels of 800 tons.

**TIDES.**—The tides rise in the harbour 15 feet at high water ordinary springs, and 12 feet at neaps. There are 25 $\frac{1}{2}$  feet at high water springs at the extreme of the eastern extension of the harbour, and 22 $\frac{1}{2}$  feet at neaps.

**Light.**—The light-house on the S. pier-head is a white building, 22 feet in height, and 33 feet above the sea, and exhibits a fixed light, visible 10 miles. The light shows red between the bearings of W. by N.  $\frac{3}{4}$  N., and N. by E.  $\frac{1}{4}$  E., and the remainder of the circle white. When less than 15 feet water at the pier-head, the light shows green instead of red. A ball, by day, is hoisted when there are 15 feet at the pier-head.

Vessels from the eastward rounding the Lizard should steer for the red or green light, taking care to keep clear of the shoals off Cuddan Point.

Vessels coming from the westward, on rounding St. Clement's Island, should run to the eastward till they open the red or green light.

Vessels working into the bay will be safe, while within about 4 miles of Penzance pier-head, if they keep the red or green light open. To enter the harbour, keep the light-house on the port-hand.

At the pier of St. Michael's Mount there is nearly the same depth as at Penzance. The tide flows in Mount's Bay, on full and change, 4h. 30. Springs rise 16 $\frac{1}{2}$  feet, neaps 12 $\frac{1}{2}$  feet.

**Anchorage.**—The principal anchorage in the bay is in Gwavas Lake, S.W. of the harbour of Penzance, sheltered from all winds but those between S.S.W. and S.E.

The mark for anchoring in Gwavas Lake is, St. Clement's Island, just shut in with Penlee Point, in 5 fathoms. Large ships generally anchor outside the Low Lee and Carn Base Rocks, between St. Michael's Mount and St. Clement's Island, in 12 or 13 fathoms.

**Directions.**—In coming from the eastward and bound to Penzance, with a westerly wind, having cleared the Lizard well to the southward, you must keep your luff across the mouth of the bay, as you haul in from the westernmost land, near St. Clement's Island, which lies off Mousehole; but be careful to keep St. Paul's Church tower in sight above the land till northward of Penlee Point, then

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steer for Penzance, keeping the windows of the tower of St. Paul's Church in sight, until you bring that tower to the northward of the long hedge (about halfway between Newlyn and Penlee Point) which hedge will then appear to come straight from the church to the cliff. Having got this latter mark on, and wishing to anchor in Gwavas Lake, haul in for Newlyn pier-head, or keep a white-house (in the corner of a field just above Newlyn) on with the middle of Newlyn pier-head, until you lose sight of St. Paul's Church tower, and open St. Hilary spire to the northward of St. Michael's Mount, when you may anchor with St. Clement's Island just shut in with Penlee Point in 5 fathoms, and have the best ground for holding in the lake. You should observe to lay your small bower to the E.N.E., and your best bower to the W.S.W., in order that you may ride with an open hawse during S.E. and southerly winds, which bring a heavy sea into this road. The steeple of St. Hilary Church is a tall white spire, on the high land to the eastward of Marazion.

About one-third of a mile S. by W.  $\frac{1}{4}$  W. from Penzance light-house is the Gear. When turning in here, take care not to shut in Godolphin Hill with the S.E. side of St. Michael's Mount, for otherwise you will run on this rock. S.E. and southerly winds, cause a heavy swell to come into this bay; but here, as at Torbay, is an underset to windward, which makes ships ride easy, and the harder the wind blows the stronger will be the underset to windward.

As there is very little tide in the N.W. part of Mount's bay, ships will generally lie with their heads to the wind; if their ground tackle be good they will ride safely, unless the wind should come round to the N.W. or N., and blow hard, in that case the anchors may come home, because the ground has a descent to leeward.

If coming from the southward and having made a stretch to the northward, as far as between Carndu and Cuddon Points, and proceeding towards Gulval at the head of the bay, the soundings will gradually decrease from 20 to  $9\frac{1}{2}$  fathoms at low water. In the latter depth, which is nearly  $1\frac{1}{2}$  mile from the shore, you may haul to the anchorage in Gwavas Lake, if it is not time to take the harbour.

If bound into Mount's Bay from the westward, and you are making, or are off the land, at the Land's End, a bearing of the light on the Wolf Rock will be a good guide, and your first care must be to clear the Runnelstone by keeping Godolphin Hill open of Carndu Point bearing about E. by N., and as that point is approached Mount St. Michael must be opened S. of it to clear the Buck Rocks (which lie close to the shore off Tetterdu Point and cover at two-thirds flood.) When approaching Carndu Point, keep Tetterdu Point well open S. of Carn Barges, to avoid the Lelland, a rock off Carndu Point, which covers at quarter-flood. Having cleared the Lelland, and steering to the N.-eastward, past St. Clement's Island, bring Trithal engine-house in one with York House, N.  $\frac{1}{4}$  W., and it will lead to the eastward of Low Lee and Carn Base Rocks, and direct to the anchorage in about 9 fathoms, with the tower on Mount St. Michael in line with St. Hilary Church spire bearing E., and the beacon on the Gear Rock N. by E.  $\frac{3}{4}$  E. Small vessels anchor further to the westward in Gwavas Lake.

If it should be at night that you have rounded the Lizard Point from the eastward, and there should be a ground swell on, keep to the westward for 2 or 3 miles before hauling up to the northward, and when within range of the light at Penzance (red or green according to the state of the tide, or depth of water at the pier) bring it to bear N. by W.  $\frac{1}{4}$  W. and then stand directly for it, by which means the Boa and Iron Gates will be avoided, on both of which the sea at this time breaks heavily. In fine weather, when there is no ground swell, the mariner may use his own discretion in hauling to the northward. The Lizard lights kept in sight bearing S.E.  $\frac{1}{4}$  S. will lead clear of all the dangers on the E. side of Mount's Bay and up to St. Clement's Island on the western shore.

From St. Clement's Island the coast trends S.W. by W. for  $1\frac{1}{2}$  mile, then W.  $\frac{1}{4}$  N. for 5 miles to Guethensbras Point, off which lies the Runnelstone. Between, there is nothing much to notice, some few rocks close in to the shore excepted, and these will be avoided by keeping outside the distance of half a mile.

**RUNNELSTONE.**—Near the shore, between Mount's Bay and the Land's End, are several dangerous Rocks; of these the principal is the Runnelstone, a small rock, of about 4 yards long and 2 broad; its base is dry at low water, and is covered before half-flood. This rock bears from the light-house on the Longships, S.S.E., distant 4 miles; and from the flagstaff on Point Tol Peden Penwith S., three-quarters of a mile. The ground outside the Runnelstone is clear, but there are rocks and foul ground to the eastward and northward of it; therefore a passage within it cannot be recommended to strangers. With a view of enabling vessels to clear the Runnelstone with great certainty, that portion of the light at the Longships which formerly showed between the Land's End and the Runnelstone, is darkened, so that masters of vessels will be certain that they are clear of the Runnelstone as long as the Longships light is visible.

**Buoy.**—A black bell buoy, bearing a staff and globe, is moored in 16 fathoms water, about  $1\frac{1}{2}$  cable S.W. of the rock, with the beacons on the shore N. by E., and the Longships light-house N.N.W.; but this buoy is frequently washed away, and therefore no great reliance can be placed upon it.

**LEE MEAN.**—About half a cable's length S.E. by E.  $\frac{3}{4}$  E. from the Runnelstone is a rock, called the Lee Mean, which is awash at low water; and at about a cable's length N.W. by N. from the Runnelstone, lies the Carnstone, having only 8 feet over it. At the distance of 4 cables N.E.  $\frac{1}{4}$  E. from the Runnelstone, is another, called Lee Ore, of about a cable's length over, with 11 feet on it at low water; between this and the Lee Mean are 6 fathoms. There is a passage between these rocks and the main, in which are 10 fathoms; but it is seldom used.

**POLDEW.**—About one-third of a mile W.N.W. from the Runnelstone lies a bed of rocks, called the Poldew, having only 24 feet on them at low water; it is not more than a cable's length over each way. Between the Carn and Poldew are from 6 to 10 fathoms.

**Beacons.**—With a further view to enable vessels to avoid the Runnelstone, two beacons are erected in a line therewith at Portwarrow, near Point Tol Peden Penwith; the southern or outermost of which is of a conical form, and painted red; the northern or innermost has a large and extended base, and is coloured black, excepting a small part of the pillar, immediately above the base, which is painted white. These beacons, when in a line with each other and the Runnelstone, bear N. by E.  $\frac{1}{4}$  E.

**Directions.**—To sail to the southward of the Runnelstone, do not bring the beacons in one until the base of the northern or black-and-white beacon is wholly visible above the land, or the Longships light-house bears N. by W.; then the line of the beacons may be crossed, and you may pass to the southward of the Runnelstone in safety.

To sail to the northward, or inside of the Runnelstone, you must use the same caution of not bringing the beacons in one until the white part of the inner beacon is entirely hidden by the land, and the Longships light-house is just open of the land; then the line of the beacons may be crossed, and you may sail to the northward of the Runnelstone.

To sail through the Inner Channel, which is considered the safest and best, as the tide sets more regularly therein, and begins to run to the eastward (which it does for three hours only), an hour before it is high water on the shore, shut in the Longships light-house with the land, or keep Tetterdu Point just open of Castle Treveen Point.

Vessels turning through the passage between Runnelstone and Point Tol Peden Penwith, must be very careful, when in a line with the beacons, to put about the moment the white part of the northern beacon appears above the land.

As the dangers to be avoided in passing inside the Runnelstone are numerous, it is particularly recommended not to attempt these passages, unless well acquainted with them, and having a smooth sea and clear weather, with a weather tide setting to the eastward only, and a fair wind; and at no time with a N.E. wind on a lee tide. But perfect safety can only be ensured by sailing to the southward of the Runnelstone

Mariners should be particularly attentive to the bearings of the Longships light-house by day, as well as of the light by night ; the light being now masked, when in line with the Runnelstone. (See page 91.)

Not any of the rocks within the Runnelstone have more than 11 feet on them at low water, but some much less ; and in stormy weather, at low water, the sea breaks over them tremendously.

The **LONGSHIPS** are a detached group of high rocks, on the largest of which the light-house is erected, and lie about 3 miles N.N.W.  $\frac{1}{2}$  W. from Tol Peden Penwith, or the S.E. point of the Land's End, and a mile W.N.W. from the westernmost point ; they extend about half a mile N. and S., appear very high above the water, and may be seen 4 or 5 leagues off.

**Light.**—A new light-house has been erected on the Longships rock. The light now exhibited shows white seaward between the bearings S.S.W.  $\frac{1}{2}$  W. and N. by W., these bearings leading half a mile outside the Brisons rocks, and three-quarters of a mile outside the Runnelstone. It shows red between the bearings S.S.W.  $\frac{1}{2}$  W. and S.W., and also between the bearings N. by W. and N.N.W.  $\frac{1}{2}$  W. A red light of less power is apparent between the light-house and the land.

In thick or foggy weather a bell will be sounded twice in quick succession every quarter of a minute.

The light bears from Cape Cornwall S.W.  $\frac{1}{2}$  W., distant 4 miles ; from the Brisons S.W.  $\frac{1}{2}$  S., distant  $3\frac{1}{2}$  miles ; from the Runnelstone N.N.W., distant nearly 4 miles ; from the Wolf Rock N.E.  $\frac{1}{2}$  N., distant  $7\frac{1}{2}$  miles ; and from the light-house of St. Agnes, Scilly, E., northerly, distant 25 miles.

The **LAND'S END**.—The westernmost point of Cornwall, when seen from the S.-westward, appears in two round hummocks, and when approached, a third hummock will be perceived, and some buildings ; the most conspicuous being the spire steeple of St. Buryan and Sennen, and St. Michael's Mount, to the eastward.

There is a passage between the Longships and the Land's End for ships of any draught of water ; it is, however, very narrow and intricate, and therefore seldom used, excepting by coasters. From the northernmost part of the Longships to about half-way towards the westernmost point of the Land's End, lies a shoal, called the Ketel Boton, on the N. part of which are some rocks, which cover at three-quarter flood. A little to the southward of the westernmost point of the Land's End is a small island near the shore ; near to this island, on the W. side, lie some rocks, which make the passage between the island and the Ketel Boton dangerous, so that it is seldom used by any but small vessels. This passage is only one-third of a mile in width ; the Brisons, some high rocks 70 to 90 feet high, off Cape Cornwall, and 3 miles to the northward of the Land's End, bearing N.N.E., easterly, lead through the passage.

About half a mile E.N.E. from the northernmost rock on the Longships are some rocks, called the Shark's Fins, which cover at two-thirds flood ; and another rock, named Fe-les, lies S.W. by S., one-third of a mile from the Shark's Fin ; this covers at quarter-flood. Off Peden-Meandu Point the ground is foul and rocky : it should not, therefore, be approached within half a mile.

The Brisons Rocks lie about  $3\frac{1}{2}$  miles, N.E.  $\frac{1}{2}$  N., from the Longships ; they are two high, small, round rocks, the largest of which is called Brison Island, and lies about three-quarters of a mile from Cape Cornwall.

A sunken rock, called the Vyneck, lies about two-thirds of a mile, N.E., from the Brisons, which must be avoided by keeping the Longships open to the westward of the latter.

**WOLF ROCK and Light-house.**—The Wolf Rock is about 180 feet in length, north and south, by 130 feet in breadth, at low water spring-tides, and is bold all round. It bears W. by N.  $\frac{1}{2}$  N., 24 miles from the Lizard ; S.W.  $\frac{1}{2}$  S. from the Longships, distant 8 miles ; about S.E. by S.,  $12\frac{1}{2}$  miles from the Seven Stones light-vessel, and E. by S.  $\frac{1}{2}$  S.,  $21\frac{1}{2}$  miles from St. Agnes light-house (Scilly). Between the rock and the Runnelstone the depths are 35, 33, and 20 fathoms, near the latter ; and within a cable's length of the rock are 30 fathoms.  
*It is high water at the Wolf Rock at 4h. 45m.*



The light-house erected on the rock is a handsome circular tower, built of grey granite, 143 feet in height, and 110 feet above high water mark. It shows a revolving light, white and red, alternately, every half-minute; visible 16 miles. Latitude  $49^{\circ} 56' 43''$ , longitude  $5^{\circ} 48' 27''$ .

Fog Bell.—In foggy weather a bell is sounded, three strokes in quick succession, every quarter of a minute.

## DIRECTIONS FROM PLYMOUTH AND FROM THE START ROUND THE LAND'S END, ETC.

SHIPS bound to the westward from Plymouth Sound, should give Penlee Point a berth in passing it, according to the directions already given; and when they are a mile or more outside of it, the course and distance to abreast of the Lizard will be W.  $\frac{3}{4}$  S., about 15 leagues. In this track the depths will be 14, 20, 26, 28, 34, and 38 fathoms. From  $1\frac{1}{2}$  mile off the Start to a similar distance off the Lizard, the course and distance are W.  $\frac{3}{4}$  N., 21 leagues; the depths 26, 34, 39, 40, 43, 42, and 38 fathoms. Being off the Lizard  $1\frac{1}{2}$  mile, the course and distance to abreast of the Runnelstone will be N. W. by W., about 6 leagues. The Runnelstone may be avoided by attending to the directions before given for sailing either within or to the southward of it.

Vessels bound round the LAND'S END, cannot make the Longships light until it bears about N. by W., and having seen it, must keep in sight of it, as it is now masked when in line with the Runnelstone; and by bringing the light to bear N.  $\frac{1}{2}$  W. or N., may steer safely for it. Give the rocks of the Longships a good berth, as the westernmost rock lies only about three-quarters of a cable's length from the light-house, and is covered at quarter-flood.

Vessels from the S.-westward have now the additional guide of the Wolf Rock revolving light, so that the channel eastward of the Scilly Islands is most efficiently lighted, having the Wolf Rock and Longships lights on the starboard hand, and the St. Agnes light-house and the Seven Stones light-vessel on the port side, and with proper attention and bearings of these lights there is little danger in passing the Land's End.

When to the northward of the Longships light, whether bound north or south, do not bring the light to the westward of S.S.W.  $\frac{1}{2}$  W., or keep the Wolf Rock light well open to the westward of the Longships, in order to keep to the westward of the Brisons, which are two high and bold rocks, or small islands, as before noticed. There is no safe passage between them and Cape Cornwall.

About a mile to the northward of the Land's End you may ride in White Sand Bay, in from 19 to 25 fathoms. This bay is well sheltered from N.E., easterly, and S.E. winds; but the danger of being caught in it by westerly winds makes it little frequented. Cape Cornwall lies N.N.E.  $\frac{1}{2}$  E., about  $3\frac{1}{2}$  miles from the Land's End.

TIDES.—The tide of flood, with respect to the W. coasts of England, may be considered as beginning at the Land's End, near the Longships; there the stream divides, one part setting to the northward, the other to the S.-eastward; and it flows, on full and change days, at 4h. 35m. It here sets 9h. to the northward, and only 3h. to the southward. At the Runnelstone and Wolf Rock, it flows at 4h. 45m. Outside the Wolf Rock in the offing, the tide runs to the eastward until it is half-ebb by the shore; and when it is half-ebb in Mount's Bay, the stream at the Land's End begins to run to the northward. At first it runs N.W., continuing to alter, until it comes to the N.E.; it is then high water by the shore. During the flood, the stream at the Land's End sets from the southward nearly 9 hours; and in most places it continues to run about 8 hours. Between the Land's End and Scilly, the ebb-tide runs only from 3 to 4 hours; this, if not properly attended to, may prove exceedingly dangerous. To the southward of the Wolf Rock, the flood, during the first 3 hours, sets E.S.E. When it is half-ebb by the shore, in Mount's Bay, the

ebb-tide at the Wolf Rock begins to set to the W.S.W., and continues to run for 6 hours, or until it is half-flood by the shore. S.W. winds and stormy weather generally raise the tides to the height of 30 feet; common spring tides rise above 20 feet, neap tides rise only 12 to 14 feet. Northerly winds sometimes keep the tide back an hour or more, and the S.W. winds make it flow an hour longer; it is therefore, highly necessary that proper allowance be made for such winds, especially at their beginning, and when they blow very strong.

In Mount's Bay the velocity of the stream on spring-tides is 2 miles an hour, neaps a mile; at the Wolf Rock, springs run 3 miles, neaps a mile; at the Longships, springs run 5 miles, neaps 2; and to the northward the tides slacken and run slower.

### THE SCILLY ISLANDS, SEVEN STONES, &c.

The Scilly Islands may be seen, in clear weather, 20 miles off; when you are approaching them at that distance from the southward, you will have from 58 to 62 fathoms, grey sand, and bits of shells; and coming from the northward, at the same distance, you will have from 43 to 56 fathoms, sand.

From the Longships light-house to St. Agnes light-house, the bearing is nearly W. and the distance 26 miles; from the Lizard to St. Agnes, W. by N.  $\frac{1}{2}$  N., 45 miles; from the Wolf Rock to St. Agnes, W. by N.  $\frac{1}{2}$  N., 21 $\frac{1}{2}$  miles.

**Lights.**—**ST. AGNES.**—St. Agnes light-house is erected on high ground, and built of stone, 74 feet in height, having a white appearance, showing a revolving light every minute, and forming a most useful object, by day or night, being visible, in clear weather, 5 or 6 leagues off, excepting when bearing between S. by W. and W., that is, from the northward and N.-eastward; for between these two bearings it is only occasionally seen between the islands, at short intervals. The lantern is 138 feet above high water mark.

**BISHOP ROCK.**—The light-house erected on the Bishop Rock, is a noble structure of grey granite, 147 feet in height, the lantern of which is 110 feet above high water, and at a distance has much the appearance of the Eddystone, but is distinguished from that by not having the red and white belts. It exhibits a fixed bright light of the first order, being visible all round to the distance of 16 miles, excepting from the eastward, where it is obscured by the islands, from S.W. by W., and W. by N.  $\frac{1}{2}$  N.; but between these bearings a streak of the light is seen in the direction of W. by S. between the islands of St. Martin and St. Mary, which leads to the southward of the South Stone of the Seven Stones. Latitude of the light-house 49° 52' 23" N., longitude 6° 26' 40" W.

**SEVEN STONES.**—The dangers which lie in the way between the Scilly Islands and the Land's End are the Seven Stones, bearing from the Longships light W.N.W.  $\frac{1}{2}$  W., distant nearly 5 leagues; the centre of them bears from St. Martin's Head, E.N.E.  $\frac{1}{2}$  E., distant 7 miles. Menewethan Isle, its apparent length open to the eastward of Newfoundland Point, bearing S.W. by W., will lead two-thirds of a mile to the N.-westward of them; and Round Island its apparent length open to the northward of Shipman Head, bearing W.  $\frac{3}{4}$  N., will lead about half a mile to the southward of them. They extend nearly a mile N.N.W. and S.S.E., and are about a mile in breadth; none of them appear above water till half-ebb, and some of them only at low-water. The sea always breaks over them, and the breakers in clear weather, may be seen at a distance of 3 or 4 leagues. Between these rocks and the Land's End, and also between them and Scilly, the tide runs 9h. to the northward and only 3 to the southward. On the E. side of the Seven Stones, distant a mile are 41 and 44 fathoms; midway between them and the Longships are 38 fathoms; and a mile W. of the Longships, 30 and 31 fathoms. On the W. side of the Seven Stones, a mile distant, is 40 fathoms; midway between them and St. Martin's Head, 41 fathoms, rocky ground; and a mile from St. Martin's Head, 42 fathoms gravel and sand. A mile N. of the 7 stones are 40 fathoms; and to the

southward of them at that distance, are 41 fathoms, rocky ground. Within the distance of a mile, the water becomes shallower, the bottom all rocky.

**Light-vessel.**—This light-vessel is moored in 40 fathoms, about  $1\frac{1}{2}$  mile E. from Pollard Rock of the Seven Stones, and about the same distance E. by N.  $\frac{1}{2}$  N. from the S. Stone.

The lights on board this vessel consist of two bright fixed lights; one on the mainmast, burning at an elevation of 28 feet above the water, and one on the foremast, at an elevation of 20 feet above the same level.

**Notice, Alteration.**—In the course of the summer of 1878, it is intended to discontinue the present two fixed lights at the Seven Stones, and to exhibit in lieu thereof, one white revolving light, showing three flashes in quick succession, followed by an interval of 36 seconds of darkness, the whole revolution occupying one minute. The light will be exhibited at an elevation of 36 feet above the level of the sea.

A fog horn is sounded at intervals of 10 seconds during foggy weather, and a gun fired if a vessel is seen standing into danger.

Vessels navigating between the Scilly Islands and the Land's End should endeavour to bring the light-vessel to bear to the westward of S., when coming from the northward; and those approaching the light-vessel from the southward, should keep her to the westward of N.

Ships on a wind coming from the northward or southward, seeing or hearing signals of danger from the Seven Stones light-ship should immediately tack, and stand away in the opposite direction for a considerable time.

Ships running before the wind, should immediately haul to the wind on either tack until they are out of danger.

THE SCILLY ISLANDS are small, with many rocks above water, which cannot properly be called islands; and the whole are surrounded with a great number of rocks and ledges, some of which show at half-tide, some at low water, but by far the greater part never appear at all. Many of these sunken rocks have only 8, 6, 4, or 2 feet on them at low water, spring-tides.

The channels or passages between the several islands which leads to harbours and roads are called Sounds, and dangerous to strangers; but so well known to the fishermen who inhabit the islands, that they are able to conduct ships through them with great safety. Some of these islands are inhabited, viz.:—St. Mary's, St. Agnes, St. Martin's, Trescow, Bryer and Samson.

ST. MARY'S ISLAND is the largest of the six, being above 2 miles long and  $1\frac{1}{2}$  mile broad.

ST. AGNES lies about a mile from the western part of St. Mary's, and is the southernmost of all the islands; for the very large rocks which lie to the S.W. of it cannot with propriety be called islands. Upon St. Agnes stands the light-house of that name, already described.

ST. MARTIN'S lies about  $1\frac{1}{2}$  mile to the N.-eastward of the northernmost part of St. Mary's, and is about half the size of that Island.

TRESCOW ISLAND lies about a mile to the westward of that of St. Martin's, and not a mile to the N.-westward of St. Mary's; it is not so large as the Island of St. Martin's.

BYER ISLAND lies to the westward of Trescow, to which it is joined by a flat, which nearly dries at low spring-tides.

SAMSON ISLAND lies south of Bryer, and S.W. of Trescow, being about two-thirds of a mile in length, and one-third in breadth.

The principal, as indeed the only place of importance in the Scilly Islands, is the town of St. Mary's, situated on the N.W. coast of St. Mary's Island, where there is a small harbour formed by the old and new piers. St. Mary's Road, which is to the N.W. of the town, affords shelter from all winds except those from the westward between W.N.W. and S.W.; and these latter winds bring up a heavy fetch of the sea, and should a vessel not be able to hold at her anchors, she may, by taking the proper time of tide, get to sea through Crow Sound to the eastward.

There are five distinct entrances into St. Mary's Road, the principal, from the

S.-eastward, being St. Mary's Sound; next, westward, Smith Sound; from the S.-westward (to the northward of the Bishop Rock light-house, and between that and the Crim Rocks), the Broad Sound; and the North Channel, between the Mincarlo Rocks and the Nun Deeps; then, on the eastern side of the group, the Crow Sound, already noticed:—

**ST. MARY'S SOUND**, between the islands of St. Mary's and St. Agnes, is perhaps, the best and safest channel, the dangers of the western channels lying so far off the land. There are several dangers in St. Mary's Sound which render it necessary to have a pilot to take you in. These are the Gilstone, Pollard, and Woolpack on the eastern side; the Little, Spanish, and Bartholomew Ledges lying in mid-channel; and the Wetnose, Round Rock, and Perconger Ledge on the western side of the Sound. Besides the above dangers, there are in rounding to the N.-eastward to St. Mary's Road, off the coast, the Tristy and Woodcock Ledges, which must be kept clear of.

Of the above dangers the **GILSTONE ROCK** lies E. by S., half a mile from Peninnis Head, and covers at three-quarter flood. To pass to the southward of it, keep **Menewethan Islet** in line with the Newfoundland Rocks N.E. by E.  $\frac{1}{4}$  E., until the great Smith Rock opens of Peninnis Head W.N.W.

**POLLARD ROCK** lies 100 feet off the N.W. point of Peninnis Head, and dries 7 feet at low water springs.

The **WOOLPACK** projects nearly  $1\frac{1}{2}$  cable to the S.W. from Woolpack Point, and dries a little before low water. An iron beacon with cage on top is erected on it.

The **TRISTY** has  $3\frac{1}{2}$  fathoms on it, and the Woodcock only 8 feet at low water. **Hangman Island**, open west of the Nut Rock N.  $\frac{1}{2}$  E., leads westward of the Tristy; and the Day Mark on St. Martin's Island, in line with the Greeb Rock N.E. by E.  $\frac{3}{4}$  E., leads northward of both shoals.

The **SPANISH LEDGE** has depths of 1 to 3 fathoms on it between the rocky heads, which dry at low water springs. Blue Carn, in line with the south extreme of Peninnis Head, leads to the southward; as will also Newfoundland Outer Rock, open of Giant's Castle E. by N.  $\frac{3}{4}$  N.; the N.E. part of Mincarlo Islet in line with the highest point of Great Minalto N.N.W.  $\frac{3}{4}$  W. leads N.-westward; Hangman Islet, in line with the Stevel Rock N.  $\frac{1}{2}$  E., leads westward; and the Cow Rock, a little open of the Kittern Rock W. by N.  $\frac{1}{4}$  N., leads northward.

**Buoy**.—On **SPANISH LEDGE** is a conical buoy, black-and-white vertical stripes, in 6 fathoms with Woolpack beacon N.  $\frac{3}{4}$  W. half a mile.

The **LITTLE LEDGE**, with only 7 feet upon it, lies one-sixth of a mile southward of the Spanish Ledge; and the same mark clears it to the southward.

The **BARTHOLOMEW LEDGE** lies in the inner part of the Sound, and has some rocky heads on it which dry at low water springs. The old mill of Peninnis, open south of the Wras Rock E. by S.  $\frac{1}{2}$  S., leads southward; Droptnose Rock, open east of Bow Rock S.  $\frac{3}{4}$  E., leads eastward; Droptnose Rock, open west of Bow Rock bearing south, leads westward; and Peninnis old mill, in line with the battery on Woolpack Point S.E. by E.  $\frac{1}{2}$  E., easterly, leads to the northward.

**Buoy**.—On **BARTHOLOMEW LEDGE** is a conical buoy, black-and-white vertical stripes, in 7 fathoms at low water with Woolpack beacon S.E. by E.  $\frac{1}{2}$  E.,  $2\frac{1}{2}$  cables, Spanish ledge buoy S.S.E.  $\frac{1}{2}$  E., seven-tenth's of a mile, St. Agnes light-house S.W. by W.  $1\frac{1}{2}$  mile.

The **WETNOSE** and **ROUND ROCK** lie on the western side of the Sound, near to Gugh Island, the former having  $3\frac{1}{2}$  fathoms, and the latter drying 4 feet. Highest part of Hangman Island, in line with Stevel Rock, leads to the eastward, and forms the leading mark between these rocks and the Spanish Ledge.

The **PERCONGER LEDGE** lies more than half a mile to the N.-westward, a quarter of a mile off the shore, and has 6 feet over it; Carn Irishman, on Annet Island, open north of Little Smith Rock W.  $\frac{3}{4}$  N., leads to the northward. Between this ledge and that of St. Bartholomew the distance is a quarter of a mile, and as the usual track through the Sound is to the eastward of St. Bartholomew, the Perconger is more out of the way.

It is on all occasions necessary to take a pilot for any of the harbours of Scilly.

**Directions.**—Vessels coming from the eastward, and bound to St. Mary's Road through this Sound may run in for the land at the southernmost point of St. Mary's Island, called Peninnis Point, which is a remarkable bluff; but you must not approach nearer than 16 fathoms, for it is bold-to; and from this depth off the point you will in a N.W.  $\frac{1}{2}$  W. direction carry 12, 11, and 10 fathoms gradually, as you approach the Woolpack, which, as before observed, lies near the shore, and has a beacon upon it. Off this rock are 7 or 8 fathoms. When abreast of the beacon you may haul up N.N.W. to round the W. end of St. Mary's Island, called Stevel Point, for the road. In pursuing this course you will keep nearer to St. Mary's Island in order to avoid the Spanish Ledge, which lies about mid-channel; and also the St. Bartholomew Ledge.

On coming in from sea in clear weather, and you have confidence in making out the marks, bring the N.E. part of Mincarlo in line with the highest part of Great Minalto, bearing N.N.W.  $\frac{1}{2}$  W., and this mark kept steady will lead clear through St. Mary's Sound for you to haul to the N.-eastward for the road.

**The Road.**—The inner anchorage of the road is to the N. by E. of Stevel Point, in 5 or 6 fathoms, to the N.W. of the Pool, with the beacon on the ledge off the harbour, bearing S.E., distant about half a mile; or farther out in the road, in 9 or 8 fathoms, with Stevel Rock bearing S.S.E.  $\frac{1}{2}$  E., and Great Minalto N.W.  $\frac{1}{2}$  W. In this roadstead you will be sheltered from all but S.W. winds, and these always drive in a heavy sea. St. Mary's Road is a good harbour, and has been strongly recommended for vessels beating about in the vicinity with easterly winds.

In St. Mary's Sound the tide sets out S.E. by E. until it is 2 hours' ebb on shore; it then alters, and sets N.W. by W.

**CROW SOUND** lies between St. Mary's and St. Martin's Islands. This channel has a bar, on which are no more than 3 feet. To the S.E. of St. Martin's Island are a group of smaller islands, called the Eastern Islands; and on the S. side of the island is a long flat of sand and rocks; from this flat the bar extends quite across the channel; the deepest water being near to St. Mary's Island.

To sail from the eastward for Crow Sound as far as abreast of Inisigden Island, bring Crow Point, which is the S. part of Trescow, open to the right of Bar Point, which is the N. point of St. Mary's, bearing N.W. by W.  $\frac{3}{4}$  W.

To sail from Inisigden Island to Crow Bar, keep any part of Toll's Island open to the east of Inisigden Island S.S.E.  $\frac{1}{2}$  E.; do not go too far to the northward, because of the flats and dangers which surround the S. part of St. Martin's Island.

To sail through Crow Sound, between the Hats and Cadedna, keep the Great Carn of Menawore a little open to the right of Guther's Rock, bearing N.N.W. This mark will carry you to the New Grounds anchorage, where, with easterly winds, vessels may anchor until there shall be water enough to go over the bar; the mark for this anchorage being Menewethan and Great Ganinick in one, bearing E.S.E., and the Crow Rock beacon W.  $\frac{3}{4}$  S.: the depth being  $2\frac{1}{2}$  and 3 fathoms. Vessels sometimes stop on the E. side of Crow Bar, in 4 and 5 fathoms, with the Nut Rock a little open to the southward of the Crow; this may be done with N.E. and southerly winds, but with easterly or S.E. winds such anchorages must be extremely dangerous.

**The Crow Rock Beacon.**—This rock lies off the northern part of St. Mary's Island, a quarter of a mile west of the Bar Point, and has an iron beacon with a cage erected upon it. The rock is remarkable in having three distinct heads, called the Great Crow, Little Crow, and Crow Foot, and has long been used to point out the depth of water on the Crow Bar: but although the depths may be pretty fairly estimated, it must be borne in mind, that the bar varies in gales of wind. At high water, ordinary springs, there are 21 feet on Crow Bar; at three-quarter flood, or quarter-ebb, 17 feet; at half-flood, or half-ebb, 11 feet; at quarter flood, or three-quarter-ebb, 5 feet; and at low water, 1 foot; but even this depth will be increased with westerly gales, and lessened with those from the eastward. The Great Crow is nearly awash at 5 hours' flood; the Little Crow is awash at about 4 hours' flood, or after 2 hours' ebb; and the Crow Foot is nearly awash at quarter-flood, or three-quarter ebb.

[E. CHANNEL.]

From the above anchorage off the Great Ganinick steer towards the Crow Rock beacon W. by S., which will carry you over the bar; and having passed the Crow beacon, keep half a point more to the southward, and go between the Pots and Greeb Rock to St. Mary's Road. From abreast of Banty Carn Point, bring St. Martin's day-mark open to the northward of the Crow Rock, and it will lead to the road.

The tides here set out to the S.E. at three-quarter flood, and continue till three-quarter ebb; they then turn N.W. from the entrance of the Sound to the bar, where they meet the tide which runs into St. Mary's Road W.S.W.

SMITH'S SOUND is narrow, but deep; it lies to the westward of St. Agnes, between it and the island of Annet. You must leave St. Agnes on the starboard, and all the western rocks on the port side, bringing a high round rock to the westward of Bryer Island, called Castle Bryer, in line with the saddle of the rock, which lies about half a mile to the N.-westward of St. Agnes, called Great Smith Rock, N. by E.; run in with this mark on, until you are abreast of the northern end of St. Agnes Island, called Burnt Island; give this island a berth of nearly a quarter of a mile, and if your vessel is of great draught, do not come nearer than one-third of a mile to Great Smith Rock, for there are three small knolls, called the Quoins, with 2, 2½, and 3 fathoms over them, lying directly in this track, and about a quarter of a mile from the Great Smith; therefore, when at the before-mentioned distance from it, steer towards Annet Island, and when abreast of the Smith, bring Crow Point, N.E. ¼ E., which course will carry you clear until you get the leading-mark on for Broad Sound. You will also avoid the Quoins, by opening Castle Bryer, as you draw near to them, to the left of the Smith Rock.

The tide, at 4 hours' flood, sets out of the Sound S.E., continuing so until 2 hours' ebb, running nearly the same through all the western rocks, as far as the Bishop; but to the northward of that the harbour tide sets in.

BROAD SOUND is mostly used by vessels coming from the southward or the westward. It has two channels: one is called the North Channel, and the other Broad Sound; each of them is dangerous to those who are not well acquainted with the marks and the setting of the tides; but the southern channel is the better of the two. In sailing through this channel, you must run between the Bishop and the Crim; these are the two westernmost rocks of Scilly; they bear about N. ¾ E. and S. ¾ W. of each other, being nearly 1½ mile asunder, and partly above water; the former having the light-house erected upon it mentioned in page 94. The leading-mark through this channel is, Nornour Island its apparent breadth open to the north of Bants Carn Point; the course is about E. by N.; with this mark you will leave the Gunners and Le Jeffry on your port side, and pass to the northward of the Old Wreck, a sunken rock, which lies about N.N.W., a little more than a quarter of a mile from Annet Island, with only 6 feet over it at low water. The marks for the Old Wreck are St. Agnes light-house just open of the N. part of Annet Island, and Smith Rock S.E. by E. ¾ E., distant two-thirds of a mile. When you have passed all these rocks steer in, with the same marks on, for St. Mary's Road.

**Buoy.**—On Old Wreck is a conical buoy, black, in 7 fathoms at low water with Burnt Island S.E. ¼ S., Bishop light-house W. by S. ¼ S., 3½ miles, St. Agnes light-house S.E. ¼ S., 1½ mile.

At the Bishop and also at the Crim, the flood-tide sets to the N.-westward during the first half-hour, and afterwards E. through St. Mary's Road.

To sail through the North Channel into St. Mary's Road, keep St. Agnes light-house in line with the W. side of Great Smith, bearing S.S.E. ¼ E.; run with this mark on until you bring Broad Sound leading-mark on as above, and steer with that mark on for the road, and come to anchor in 5 or 6 fathoms. In this passage you will go between the Steeple, a small rock, awash at low springs, lying west of Mincarlo Rock two-thirds of a mile, and also several other rocks which lie off Samson Island on the one side, and the Carn Base, the Nun Deepes, and Jeffry on the other; the two former have 2½ fathoms over them, and the latter only 5 feet.

*There is another passage through the North Channel to the eastward of the*

Steeple, but it is very narrow, and the leading mark takes you within  $1\frac{1}{2}$  cable of the Biggal Ledge, to the westward of Mincarlo, and which covers at quarter-flood; and also near to the Castinicks, Carn and Peak, all dangers on the eastern side. The mark for this passage is Burnt Island, off St. Agnes, in line with the saddle of Great Smith bearing S.E.  $\frac{1}{4}$  E.; but this channel should never be attempted without a pilot.

There are various channels and passages into Broad Sound from the S.-westward, between the rocks, with deep water, but all too hazardous to attempt.

Should you fall in with the Bishop at low water, observe, that for half an hour only the stream will set to the N.N.W., therefore should you stand to the northward, you will find the tide shifting until you get to the northward of all the islands, then its direction becomes nearly E. At the time of this half hour of flood, the stream sets easterly through St. Mary's Road so far as St. Martin's.

Pol Bank.—There is a small rock, or bank, named the Pol, lying W.S.W.  $\frac{1}{4}$  W., about  $6\frac{1}{4}$  miles from St. Agnes light-house, and 3 miles S.W.  $\frac{1}{4}$  S. from the Bishop light-house; but it is not dangerous, nor has less than 13 fathoms been found over it, though there are occasional overfalls upon it near to low water.

On the N. side of the Scilly Islands are the Sounds of New and Old Grimsby, St. Helen's Pool, and Tean's Sound.

NEW GRIMSBY HARBOUR lies to the westward of Trescow Island, by which and Bryer Island, it is formed. The entrance is narrow; but when in you will ride quite secure in 5 fathoms. Off the N.W. end of Trescow lie two rocks, called the Kettle and the Kettle Bottom, on the port side in entering, which always show themselves above the water. Sail in by them, keeping the starboard or opposite headland close on board, and anchor opposite to Hangman's Island, close over to Bryer, in 5 fathoms; here you should moor: or running further in, have less water, or lie aground on a sandy beach off New Grimsby.

The mark for sailing into New Grimsby is to keep the Castle of St. Mary's, by some called Star Castle, in line with west side of Hangman's Island, bearing south.

There is also a passage for small vessels to this harbour over Trescow Flats, at tide-time, but can only be taken by those who know the locality.

In New Grimsby Harbour the flood sets in northward for  $1\frac{1}{2}$ h., and then out N.W. for 3h. At this time it turns, and sets in again for  $4\frac{1}{2}$ h., or until it is half-ebb; it then changes, and runs out during the other 3h. But between the islands Samson and Bryer the tide sets in 8h. from the westward, and then runs out westward till low water.

OLD GRIMSBY HARBOUR has good anchorage; but the entrance narrow, and is not to be attempted by strangers without a pilot.

The leading mark into Old Grimsby is, Old Blockhouse in line with Merchant's Point bearing S. by E.  $\frac{1}{4}$  E. At the entrance the water is 10 and 11 fathoms, but decreases as you get further in; thus, opposite to Merchant's Point are 5 and 4 fathoms, near Long Point 2, and abreast of the Old Blockhouse  $1\frac{1}{2}$  fathom; when once you are safely in, you lie land-locked, and can go to sea again with any wind.

St. Helen's and Tean's Sounds are very similar to that of Old Grimsby.

To sail into St. Helen's Pool, between Deep Ledge and Round Island, keep St. Mary's Castle in line with the E. Gap Rock, bearing S.S.W.; you may then pass between the Gap Rock and St. Helen's Island, for the Pool, in 5, 4, 2, and  $1\frac{1}{2}$  fathoms.

Day Mark.—ST. MARTIN'S HEAD is the easternmost point of the island which bears that name, and is distinguished by a land or daymark standing on it, in the form of a steeple, its height being 40 feet, and 203 feet above low-water. This land-mark is painted red and white in circular bands, in order that it may be better distinguished from the light-house of St. Agnes. To the northward of this head is St. Martin's Bay, where you may anchor in 15 fathoms.

A further description of the numerous rocks which everywhere surround these islands could not be of any use to the mariner, nor give him a sufficient idea of their nature, forms, or situations; we therefore, must refer him for further

particulars to the chart of the Scilly Islands, where he will find them clearly laid down.

**TIDES.**—The tide, which comes through Broad Sound, from the westward, sets E. through St. Mary's Road for the E. end of St. Martin's ; there at 4 hours' flood, it meets the tide coming round St. Martin's Head ; making, at Hanjague, a sort of race ; it then sets away S.W. by S. to Menewethan Island, where, meeting the Crow Sound tide, which sets out S.S.E. they frequently, with spring-tides, form a great race, or rippling, and go off to the southward together.

It is high water among all the islands at 4h. 30m., on the full and change days ; and the water rises at mean spring-tides 16 feet, and with neaps 12 feet. Equinoctial springs rise 20 feet.

When the weather is calm, it flows round all the islands E.N.E. ; but with northerly winds and neap-tides, N.E. ; when blowing hard, and from the southward, it will flow an hour longer, and with northerly winds an hour less.

At 2 leagues to the southward of Scilly the tides appear to run straight eastward and westward, and for nearly equal portions of time ; but near the islands they are subject to the alterations already described.

The following from Messrs. Francis Banfield and Sons, of Scilly :—The Scilly Islands are situated about 30 miles to the W. of the Land's End of England ; they form a group of 100 islands, in the best geographical situation as a port of call for ships arriving at the Channel for orders, as Scilly is 70 miles from Falmouth. Ships coming up to the entrance of the Channel with E. winds, can reach Scilly many days before they can get up to Falmouth, especially dull sailing ships with heavy cargoes ; and, also, the position is much more easy of access than Queenstown. The islands form an archipelago, shaped like a horse-shoe ; every roadstead well protected by islands at the N.W., N., N.E., E., S.E., and S.W. The least protected part is from W.S.W. to N.W. by W., but the sunken reef in Broad Sound forms a natural breakwater to the W.

Our port (St. Mary's) is most valued during the prevalence of easterly gales. We have had so many as 300 sail at one time in the different harbours. St. Mary's Road is capable of containing a fleet of 200 sail. There are 5 or 6 fathoms, with excellent holding ground of blue clay ; there is access to our roadstead by different channels, all deep water sufficient for a line-of-battle ship at low water. There are experienced Trinity pilots, at five pilot stations on different islands, having eleven pilot cutters, and numerous pilot gigs. The pilots are out cruising in the heaviest gales. The islands are quite bold at the N., E., and S. ; there are not any sunken reefs lying any distance off the shore. The great dangers of Scilly lie to the W. of St. Agnes' light, but those dangers are now protected by a light (dioptric) erected on the Bishop Rock, the extreme western rocks of the islands and the entrance of the S.W. channel ; there is plenty of good water, also provisions. At the island there are facilities for repairs of ships ; masts and spars are kept in stock by the different parties in business. There is a patent rope-walk ; also sail-makers, blacksmiths, &c. The principal trade of the port is ship-building ; vessels of upwards of 500 tons have been built at the islands.

Ships receiving orders at Scilly can proceed to either of the Three Channels direct, without having to round any angle. There is a steamer running thrice a week, with mails to Penzance ; and an electric wire is laid down to the islands.

## FROM THE LAND'S END TO HARTLAND POINT.

HAVING described the Land's End and Longships, with the dangers adjacent, we shall proceed northward towards the Bristol Channel.

About  $3\frac{1}{2}$  miles, N.E.  $\frac{1}{2}$  N. from the Longships light are the Brisons Rocks, off *Cape Cornwall*, distant about three-quarters of a mile, and running a mile to the ward along the shore ; the space between them is all foul and rocky.



From Cape Cornwall the coast runs  $2\frac{1}{2}$  miles N.E. by E. toward Three Stones Oar; within this space, about half a mile to the northward from Cape Cornwall, is the little rock under water, called the Vyneck. The Three Stones Oar lies off Pendeen Point, between which and the shore there is no passage; its distance from the western entrance to St. Ives Bay is  $8\frac{1}{2}$  miles.

**Cape Cornwall Bank.**—This bank lies N.N.E. and S.S.W.; is about 3 miles long and nearly half a mile broad; composed of rock, with very irregular soundings on it, varying from 19 to 13 fathoms at low water, and between it and the coast are 26 fathoms.

North extremity of it bears from the Longships N.  $\frac{3}{4}$  E.,  $11\frac{1}{2}$  miles; from St. Ives Head N.W. by W.,  $13\frac{1}{2}$  miles.

South extremity of it bears from the Longships N.  $\frac{1}{4}$  E., 9 miles; from St. Ives Head W. by N.  $\frac{3}{4}$  N.,  $13\frac{1}{2}$  miles.

**Bann Shoal** lies N.E. of the St. Ives Bank, has from 8 to 20 fathoms irregular soundings, and extends three-quarters of a mile N.N.E. and S.S.W. From the least water, 8 fathoms, near the S.W. end of the shoal, St. Ives Head bears S.E.  $\frac{3}{4}$  S.,  $12\frac{1}{2}$  miles; Gurnard's Head S. by E.  $\frac{1}{4}$  E., 10 miles; and Sennin Church on with high water mark at Cape Cornwall, S. by W.  $\frac{1}{4}$  W. The sea breaks heavily on it in bad weather. Cape Cornwall, S.S.W., leads eastward of the shoal; and Longships light, dipping S. by W.  $\frac{1}{4}$  W., leads between it and St. Ives Bank; Longships S.  $\frac{1}{4}$  E., leads a mile W. of St. Ives Bank.

**TIDES.**—The beginning of the flood-tide on the W. coast of England may be estimated from the Land's End, where the stream divides to the northward and eastward, flowing full and change, at 4h. 30m., and setting 9h. to the northward and 3 to the eastward.

Advancing towards the Bristol Channel, spring-tides, when strongest, off St. Ives, run 3 miles an hour, and neaps 1; but it may be here proper to remark, that in strong gales of wind from the northward, the tides will be kept back an hour or more, and with winds blowing hard from the southward, they will flow as much longer; the former also depressing the rise of the water, the latter increasing its height so much, that in stormy weather it will rise 10 feet above the customary level. These are circumstances which require attention, and a proper allowance must be made accordingly.

**ST. IVES BAY.**—**Lights.**—The Town of St. Ives lies under the W. point of the bay, and has a pier for small vessels, within which, with spring-tides, are 14 feet, and with neaps 8. On the pier, 36 feet from the end, a stone light-house is erected, 25 feet in height, and 23 feet above high-water, exhibiting a fixed white light, visible 9 miles, while there is 10 feet water. It is only shown from the 1st of September to the 30th April. In addition to the above light, there is a wooden structure 20 feet high, at the extreme end of the outer pier, showing a red light, visible 2 miles. Large vessels anchor in the road; the best position is in 9 fathoms with Battery Point N.W.  $\frac{1}{4}$  W., and Pednolver Point W.  $\frac{1}{4}$  S.; anchorage may, however, be had on both sides of the bay, but exposed to northerly winds, which never fail to throw a heavy sea into it. The pilchard fishery is here carried on to a great extent.

**HAYLE.**—**Lights.**—At the bottom of this bay you will perceive an opening between two sandy points, which form the entrance to the River Hayle, being 2 miles S.E. by S. from St. Ives; on the W. point stands Lelant Church. On the Lelant sand-hills are two fixed lights, bearing N.N.E.  $\frac{1}{4}$  E., and S.S.W.  $\frac{1}{4}$  W., 297 feet apart, and when in one lead into the channel, and shown while there is 12 feet water; visible about 6 miles. The high light is elevated 81 feet above high water, the low light 59 feet. The high light is shown from a triangular structure of three legs, painted red; the lower light from a structure with four legs in a square, painted black. On the end of Lelant Quay, is a small fixed red light.

On the W. side of the entrance a half-tide dyke is erected 8 to 12 feet above low water springs, which runs out 643 yards N. from Chapel Anjou Point. This dyke has 5 perches on it, and a small buoy to mark its extremity. The eastern side of the Channel is marked by black buoys, the outer one being a can buoy, the others mooring or warping buoys.

The bar has 19 feet on it at high water, ordinary springs, and 13 at neaps. In the river off Hayle there are 20 to 17 feet at high water springs, and 14 and 11 at neaps. On the Ferry-house there is a staff, on which a flag is hoisted, when there is sufficient water for steamers to cross the bar. There is a graving dock at Hayle that can take vessels of 250 feet in length.

You may, in cases of necessity, at high water, run between these two points, with 10 and 12 feet water; the westernmost side is the deepest. As soon as you are in you will see a deep bay or creek; steer due E. for it, where you may lay secure, upon a smooth flat sand, from a northerly wind. At the E. point of the bay is Godrevy Island, to the N.W. of which, about a mile, is a bank called the Stones, and between them are 6 and 7 fathoms; some of these stones appear above water at half-ebb.

To clear the Stones to the westward, bring Gwinnear Church in line with the old engine, chimney S. by E. To go to the northward half a mile, bring Gurnard's Head open of Carnmen Point W. by S.; and to clear them on the E. side bring Gwinnear Church in line with the E. side of Godrevy Island, S.  $\frac{1}{2}$  W.

It is high water at St. Ives, on the full and change days of the moon, at 4h. 44m.

It ought to be generally known, that vessels driven into St. Ives Bay by violent N.-westerly winds, may be run upon the beach to the westward of the opening of Hayle Harbour, and directly under the sand-hills, where Lelant Church stands; this is dead to leeward with the above wind—a circumstance which induces the mariner to avoid it—and keeping their wind as much as possible, with the hopeless prospect of reaching the pier, they perish either upon the rocks or steep sands in the western part of the Bay. It is to be remarked, that so often as accident or local knowledge has thrown a vessel upon this beach, the lives and cargo have uniformly been saved, and the ship but little damaged.

Godrevy Light-house is erected on the island of that name, and shows a flashing white light every 10 seconds, is elevated 120 feet and visible 15 miles. A fixed red light, in the same tower, in the direction of the Stones Rocks, 27 feet below the flashing light, visible from S. by E. to S.E., clears the rocks. A bell is sounded in foggy weather.

From St. Ives to Trevoze Head the course and distance are E.N.E.  $\frac{3}{4}$  N., 26 miles; the shore has various coves, cliffs, and sand-banks; these continue all the way from St. Ives nearly to Padstow.

Portreath.—E.  $\frac{1}{4}$  S., 4 miles from Godrevy Island, is Bassett Island, or Gull Rock just to the westward of the little harbour of Portreath. A pier runs out in a N. direction along the western side, and there is an inner and outer basin capable of receiving vessels of 150 tons burthen. There are 15 $\frac{1}{2}$  feet in the basin at high water springs, and 9 $\frac{1}{2}$  at neaps. The tide rises 18 feet at springs, and 12 at neaps. The entrance may easily be known by a Day-Mark, which is a white tower 25 feet high, and its base 123 feet above high water, on the head at the eastern side of the harbour.

Off St. Agnes Head are two rocks above water, called the Boden Rocks, or Man-and-his-Man; these bear from St. Ives E. by N.  $\frac{1}{4}$  N., distant nearly 12 miles. About 4 $\frac{1}{2}$  miles further is Carter's Rock, lying off Holywell Head, very near to the land. Two small rocks lie off W. Pentire Head, named the Chicks, and outside of these, half a mile from the shore, is a small knoll, with 4 $\frac{1}{2}$  fathoms, nearly abreast of the opening to Cranstock. The eastern point of entrance has two other small rocks, named the Goose Rocks; but all these are very near the shore, and have no passage within them. Further on is Towan Head, off which a reef projects; and round to the N.-eastward is a place called New Quay.

NEW QUAY HARBOUR.—The harbour is formed by two piers, the southern one running out N.N.E.  $\frac{1}{4}$  E., 137 yards, and the northern one S.E., 61 yards. On the southern pier is a tower with a flagstaff, and on the northern pier a crane. The extent of the harbour is about 3 $\frac{1}{4}$  acres, and can accommodate vessels of 13 feet draught. The bar has 16 feet water on it with a 21 feet tide, and 10 with neaps of 15 feet, but is occasionally deeper with gales from the N.E. It is high water, full and change, at 7h. 30m. Spring-tides rise 15 feet.

The distance from hence to Trevoze Head is nearly 8 miles. In the way is a rock or two close to the land, above water, near Mawgan Porth; and two sunken rocks off Park Head: the outermost of these is nearly half a mile off the point; give it therefore a berth in passing, and you will go in 6 and 7 fathoms.

**Pilots.**—BRISTOL AND ST. GEORGE'S CHANNEL PILOT BOATS will be distinguished during the night by a WHITE LIGHT at the mast-head, and a flare-up light at intervals of 15m.

**TREVOZE HEAD** appears as you approach it like an island or round hill and is easily known by the rocks which lie off its W. side, and by the white light-house on its N.-western part; the outermost of these rocks lie about three-quarters of a mile from the point, and are called the Quies.

**Lights.**—Two fixed bright lights, the highest light is 204 feet above the level of high water, and visible 20 miles.

The lower light, which is about 50 feet in advance, or to seaward of the higher light, is 129 feet above the level of high water, and visible about 17 miles.

From Trevoze Head to Stepper Point the bearing and distance are E.  $\frac{1}{2}$  S., 4 miles; between them is the Gurley, a sunken rock, with no more than 8 feet over it at low ebbs. E.N.E.,  $2\frac{1}{4}$  miles from the W. part of Trevoze Head, is the Gull Rock; it is high and steep-to, having between it and the Gurley, 6, 8, and 10 fathoms and between the Gurley and shore 6, 5, and 4, fathoms.

**POLVENTON, OR MOTHER IVE'S BAY**, lies on the E. side of Trevoze Head, and W.  $\frac{1}{2}$  N., distant 3 miles from the entrance to Padstow Harbour. Vessels may anchor here with the wind from the S. to W.N.W., in 5 to 7 fathoms at low water. With N.W. winds, haul close round the Merope Rocks, and anchor within a cable's length of them; the westernmost Merope bearing about N.N.E.

Vessels caught on the coast by gales from the N.W., and not being able to keep off, may anchor here, and wait a flowing tide to run for Padstow. It is to be observed, that the harbour of Padstow should never be attempted on an ebb-tide, or in stormy weather, unless with a leading wind. A vessel should not lie long in this bay, for should the wind shift round to the N.E., it will bring in a heavy sea, when a vessel would be in danger, there being so very little space for getting under way.

**PADSTOW HARBOUR.**—The entrance to the harbour of Padstow is bounded by Stepper and Pentire Points; they lie about N.E. and S.W., distant  $1\frac{1}{4}$  mile apart. Off Pentire Point, N.N.W., distant half a mile, is the Newland Rock, high, large, and steep-to; and E. of the Newland is a sunken rock, called the Villiers, of 6 feet, having between it and the mainland the Roscarrock Rock, and near Pentire Point another rock, called the Moulds, to the eastward, and the Rumps, &c., close to the point, making the channel between the Newland and Pentire Point somewhat hazardous; the best passage, therefore, to Padstow will be between the Gull and Newland, where midway you will have 15, 12, 9, 8, 7, and 6 fathoms, gradually decreasing towards the entrance of the harbour. A conspicuous tower or day-mark has been erected on the high land, quarter of a mile to the westward of Stepper Point, which is the westernmost point of the entrance to the harbour; the tower is 254 feet above the level of the sea, and may be seen about 20 miles off in clear weather. At 2 miles from the entrance there is a pier, where vessels may lie aground in safety. It is high water at Padstow, full and change, at 5h. 13m.; spring-tides rise  $20\frac{1}{2}$  feet, neaps  $16\frac{1}{4}$  feet. On the quay head is a small red and green fixed light.

It frequently happens, in the winter season, in gales of wind at N.W. and N.N.W., that ships are lost on this coast for want of a proper knowledge of the harbour of Padstow, this harbour offers a good and safe place for ships of large burthen, having never less than 15 or 16 feet at low water spring-tides, in the channel, which in the narrowest part is 70 fathoms wide, this channel is bounded on the W. by a steep cliff, which is bold-to, and on the E. by the Doombur Sand, which dries with the last quarter of the ebb, and should be carefully avoided in taking the harbour.

**Directions.**—In approaching the harbour from the offing, steer in for the beacon or day-mark, passing between the Gull and Newland Rocks; or, if circumstances require, sail between the Gull and Trevoze Head, keeping the Quies a handspike.

length open of Trevoze Head, to avoid the Gurley. When within half a mile of the day-mark Stepper Point will be seen on the extremity of which there is a pole, with a caution board.

On entering the harbour, keep very close to Stepper Point, and sail in by the western shore, to avoid the Doombur Sand on the port side, which dries at the last quarter-ebb. If the tide is ebbing, keep a press of sail until within the entrance, and have an anchor ready; run in, and should the eddy winds from the hills take the sails aback, then let go the anchor, by which time the boats will be ready to board from the shore, and render the necessary assistance. The best time of tide to enter the harbour is from half-flood to high water; but it should not be entered from half-ebb to quarter-flood, except under circumstances of necessity.

A little within the entrance of the harbour mooring-buoys are placed, nearly in mid-channel, and on the shore capstans are erected, posts fixed at proper intervals, warps, boats, &c., are in readiness to render assistance to vessels entering the harbour. The harbour may be occupied at all states of the tide, in smooth water, with a free wind; but ships of large draught should wait until about half-flood, and when in the harbour-cove, which is about a mile within the point, they may lie on mud, or ride afloat, as occasion requires. The harbour is an excellent outlet for ships bound to the northward.

In sailing to the northward, go between Pentire Point and the Newland; but beware of the rocks under water, already described. To the eastward, and near the shore, is an island or rock called the Moulds; and following the shore, is the small cove of Portquin.

**PORT ISAAC.**—At  $1\frac{1}{2}$  mile to the eastward of Portquin is Port Isaac, a fishing place, frequented by vessels trading to Bristol, Wales, Ireland, &c. Ships of 200 tons go in at high water, and run in on the sandy shore, where they lie safely from the force of the sea. Small vessels caught with on-shore winds will find this an excellent shelter to run into at half-tide. On nearing, the church situated above the port, will be brought to bear S. by W.  $\frac{1}{2}$  W.; the port runs a quarter of a mile in, with high land on both sides. There is a rock lying off the eastern side, on which, in blowing weather, the sea breaks; but with a flowing tide, run boldly in for that side, and when past the rock, steer in the centre of the cove, and run on the Beach. At spring-tides there is a depth of 22 to 23 feet, neaps from 11 to 12 feet; it is principally used by fishing-vessels.

Just to the eastward of Port Isaac is Port Garven, with a similar depth of water to Port Isaac; both these ports are in the district of the Port of Padstow.

About  $3\frac{1}{2}$  miles from the entrance to Port Isaac is the Otterham Rock, which always appears above water, and is almost a quarter of a mile from the shore.

**TINTAGEL HEAD.**—This head lies N.E. by E., 5 miles from Port Isaac, and is a bluff point, with a church to the S. of it. Just to the eastward is a small cove, with a rivulet running up to Trevenna; in this cove small vessels load slate. E.  $\frac{1}{2}$  N.,  $2\frac{1}{2}$  miles from Tintagel Head, is the cove of Forrabury, or Bocastle; off its entrance there is an islet, which is bold around, and in going in leave it on either side. There is high land on both sides the cove, and a tower on the western side.

N.E. by E.  $\frac{1}{2}$  E.,  $3\frac{1}{2}$  miles from this latter cove, is Carnbeak, a projecting headland, clifly and high; between is Fire Beacon Point, with the Benny Sisters' Rocks lying off; and nearer to Carnbeak is a remarkable high cliff. From Carnbeak the general trend of the clifly coast is E. by N.  $\frac{1}{2}$  N., for 5 miles, to Widemouth Bay, where begins a flat, which stretches before the coast for a considerable distance—indeed, the whole distance of the coast, up to Hartland Quay, which is about  $1\frac{1}{2}$  mile to the southward of Hartland Point; this flat is shallow, having in some parts only 3 to 1 fathom, drying on approaching the shore.

**BUDE HAVEN** lies 7 miles N.E. by E. from Carnbeak. In this haven there is little or no tide, and it is difficult to enter, the run from the northward being very strong. It is seldom frequented by any vessels but those belonging to the place. At tide-time, a flag in the day-time, and a light at night, is hoisted on the Chapel Rock, near the breakwater, when it is the proper state of the tide for vessels to

come in, or on the cliff to the westward of the harbour, near the pleasure-house, if they are to keep off.

From Bude Haven the land trends N.N.E.,  $4\frac{1}{2}$  miles to Sharpnose, then N.E. by N.,  $7\frac{1}{2}$  miles, to Hartland Point, which is the western extremity of Barnstaple Bay. In this space there is no place for a vessel to take shelter in until up to Hartland Quay, where a small pier is erected, and at which small vessels load limestone and malt. A troublesome sea sets in here from the westward. At the pier, at high water spring-tides, there is a depth of 18 feet, neaps 11 feet; high water, full and change at 5h. 45m. About half a mile inland, to the eastward, is the church of Stoke village, on the road to Hartland.

From Hartland Quay to Hartland Point the shore is rocky, and should have a good berth. The Ting Rocks lie off Hartland Point.

The coast from Pentire Head, to Hartland, is rocky and steep, and may be sailed along within half a mile from the shore, in from 6 to 11 fathoms, free from danger.

From Pentire Point to Port Isaac the distance is  $4\frac{1}{2}$  miles, and from Port Isaac to Hartland Point 28 miles, the course being N.E.  $\frac{1}{2}$  E.

From Cape Cornwall to Hartland Point the course is E.N.E., and the distance 72 miles; and from St. Martin's day-mark to Hartland Point the course is E.N.E.  $\frac{3}{4}$  E., and the distance 92 miles.

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The Directions for the BRISTOL CHANNEL are given with the LARGER SCALE CHART of that Navigation, on which Chart are several Enlarged Plans of the Harbours, &c. These Directions will also be found in the Second Volume of the "Seaman's Guide and Coaster's Companion," published in Two Volumes, price Five Shillings each.

## THE SOUTH COAST OF IRELAND,

OR

PORTS OF CALL;

FROM

BEAR HAVEN TO WATERFORD.

Variation at Bear Haven  $24^{\circ}$  W. Cork Harbour  $23\frac{1}{2}^{\circ}$  W. and  
Waterford  $23^{\circ}$  W.

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REMARKS ON THE SOUNDINGS WHEN APPROACHING THE S.W. COAST OF IRELAND  
BY CAPTAIN WHITE, R.N.

"The soundings on a supposed radius of  $5\frac{1}{2}$  leagues from Mizen Head, in any direction between W. (true) or N.W. by W.  $\frac{1}{2}$  W. and S. (true) or S.S.W.  $\frac{1}{2}$  W., do not materially differ as to depth or quality of the ground. The former varies only from 60 to 62 fathoms, and is principally of an oazy nature. Nearer to Mizen and Brow Heads, the ground partakes of more variation in quality as well as depth.

"When running in from the Western Ocean, for the purpose of rounding Cape Clear, the quality of the ground is of much greater consequence than that of the depth; for so long as the ingredients brought up by the lead remain free from oazy matter, you cannot be nearer than 6 leagues to any part of the Irish coast between the Skelligs and Brow Head, let the depth be what it may; but you may be considerably further from it. On the other hand, if oazy ground be obtained in any depth of water between 62 and 92 fathoms, you may be sure you are within that distance, and consequently to the northward of the latitude  $51^{\circ} 10'$ ; for, were you to the southward of that parallel, the ground between these limits would be totally free from oaze, until you had advanced as far eastward as the meridian of Cape Clear. This fact will prove of great importance to vessels navigating here in thick weather, or when striving to gain an offing to the westward, with scant S.-westerly winds.

"When sailing eastward, in the parallel of  $51^{\circ} 10'$ , or to the southward of it, if the soundings have decreased to 60 fathoms (no matter as to the quality of the ground), you may with equal confidence conclude that you are upon, or to the eastward of the meridian of Brow Head.—viz.,  $9^{\circ} 46'$ ; and may shape a course along the Irish coast, if necessary, N.  $68^{\circ}$  E. (true), or E. This course will carry you 4 leagues at least to the southward of the Fastnet Rock, and nearly the same distance without all the headlands, as far eastward as the Hook light-house: such is the regularity in the direction of the Irish coast between these limits.

"On the parallel of the Fastnet, and in the longitude of  $11^{\circ} 34'$ , are 286 fathoms, the ground a sort of fine dark viscus brown sand. This is the edge of the bank. Thence, as you proceed eastward, the depth decreases very suddenly. In the longitude of  $11^{\circ}$  are 96 fathoms, very fine dark sand. From thence to the longitude of  $10^{\circ} 30'$  the depth decreases more gradually—viz., about 4 fathoms every 5 miles; and again decreases very suddenly, until within  $5\frac{1}{2}$  leagues of the land. At 7 leagues westward of Mizen Head there are 60 fathoms, oazy ground; and not further off than 10 leagues, 80 fathoms will be found, the bottom oazy as before."

**BANTRY BAY** lies to the northward of Dunmanus Bay, between Sheep Head and Bear Island. It is large, safe, and commodious for ships of any size. The stream of tide is scarcely sensible in any part of it. The water is sufficiently deep almost close to both the shores; and there are no rocks or shoals in the way, but such as may be easily avoided, even in the night. Ships may stop anywhere in the middle of the bay, on good ground, or in most parts, near to either side. Hungry Hill on the N. side of the bay, is a conspicuous landmark, having a pyramid at the top, 2,181 feet above the sea.

**Light.**—The light-house on Roancarrig Island, at the western entrance to Bear Haven, shows a fixed bright light to seaward and to the haven from W. by N. to S.E. by E.  $\frac{1}{2}$  E., at an elevation of 55 feet over the level of high water, and visible 12 miles. The tower is circular, coloured white, and has, under the projecting gallery, a belt of red colour. A building of oblong form is attached to the tower.

**Anchorage.**—At the bottom of the bay are two anchorages, one on the S., the other on the N. side. That on the S. shore is within Whiddy Island, to the northward of Bantry Town, commonly called Bantry Harbour. The westernmost entrance is not more than 2 cables' length wide; and here is a bar, of 7 feet at low water, just without the narrows; and without the bar, 2 cables' length, is a shoal of 6 feet, called the Cracker. In the narrowest part are  $3\frac{1}{2}$  fathoms, and further in from 5 to 6 fathoms. Along the E. side of Whiddy Island are five small Islands. The best anchorage is to the southward of the four southernmost, in 5 to 6 fathoms, quite land-locked. The best passage is to the northward of Whiddy Island, and round the east end of it.

The anchorage off the E. end of Whiddy Island, and N. of Horse Island, is called Whiddy Harbour, and large vessels may lie here well sheltered out of the tide in 9 or 10 fathoms, or run further into Bantry Harbour. The leading-mark in running in from Whiddy to Bantry Harbour, to the eastward of Horse and Chapel Islands, is the flagstaff, Bantry House, and a farm-house, in a line, bearing S.S.W.  $\frac{1}{2}$  W. High water at Bantry Harbour F. and C., at 3h. 47m. Spring-tides rise 10 feet neaps  $7\frac{1}{2}$  feet.

Vessels entering Bantry Harbour are cautioned not to anchor nearer the town of Bantry than where the flagstaff, in front of Bantry House, bears S. by W.  $\frac{1}{2}$  W.; and the centre battery on Whiddy Island N.  $\frac{1}{2}$  W. This precaution is absolutely necessary as the inner section of the harbour has become extremely dangerous, by allowing vessels to throw their ballast overboard. At low-water spring tides, there are only 9 feet over the outer shoal, which lies with the flagstaff in front of Bantry House W.S.W., and the centre battery on Whiddy Island N. by W.  $\frac{1}{2}$  W.; with the Seliboon Rock of 6 feet, at 1 cable to the N.W. of it.

**GLENGARIF HARBOUR** is on the N. side of Bantry Bay, opposite to Whiddy Island, and the entrance narrow. This place is very small, and the ground indifferent; it is seldom used by any but coasters. In summer the largest ships may ride without the island, at the mouth of the harbour, in 7 to 9 fathoms, good holding ground. Anchor near mid-channel to avoid the Portuguese Rock, of 12 feet, which lies one-third over from the western shore, with Garnish tower N.E. At the anchorage the tower will bear N. by E.

**BEAR HAVEN** is a good harbour large and well sheltered, with good ground. The water is sufficiently deep for the largest ships. It has two entrances, one at the E. end of Bear Island, and the other at the W. end. The Western entrance is the most convenient for ships from the westward, but the other is the safest for strangers. There is a signal tower standing on the westernmost elevation of Bear island, which serves to mark out this entrance; it is elevated 668 feet. You may anchor anywhere on the N. side of the island, in from 5 to 11 fathoms; but off Ballinakilla is the best place. Ships that wait for a wind will find the W. end of the harbour the most convenient.

In the W. entrance, which is only 150 fathoms wide, are two rocks, one near the middle of the narrows, called Harbour Rock, on which are only 11 feet; its situation is pointed out by a red buoy, moored in 16 feet water on the S.E. side of

the rock ; and another on the western side, off Dunboy House, called Big Colt Rock, which appears at 4 hours' ebb. The mark for the Harbour Rock, is the pyramid on Hungry Hill nearly on with the fort which stands on the N.W. end of Bear Island. Brandy Hall (a conspicuous object in the N.E. of Castletown Harbour) kept its apparent breadth open of the W. point of Dinish Island leads to the eastward of the Harbour Rock, in  $4\frac{1}{2}$  fathoms.

In order to avoid all these rocks, steer as nearly mid-channel as possible, as no uninterrupted leading-mark can be given, borrowing somewhat near to Bear Island as you close with the Harbour Rock, and again hauling into mid-channel as soon after passing it. Care must also be taken to avoid a rocky ledge, of 7 feet, which runs nearly a quarter of a mile S.S.W. from Dinish Island ; this is called the Walter Scott Rock, and has a white buoy on its southern edge. There are also some rocks off the northern point of Bear Island. In the narrows southward of Harbour Rock, springs run 2 knots.

VOLAGE ROCK, of 9 feet, lies three-quarters of a mile to the eastward of the Walter Scott Rock, and is also marked by a white buoy. The Hornet Rock lies three-quarters of a mile eastward of the Volage, and is marked by a black buoy. These three latter buoys lie on the N. of the Haven. At Castletown, Bear Haven, high water, full and change, at 4h. 14m. ; springs rise  $9\frac{1}{2}$  feet, neaps  $7\frac{1}{2}$  feet.

Directions.—When attempting the western entrance into Bear Haven, some precaution is necessary, as the little inlet of Puleen, 2 miles to the westward, when viewed from the S.-westward, puts on nearly the same appearance as the entrance, and may possibly be mistaken for it by a stranger. In order to guard against this, bear in mind that the pitch on Mizen Head nearly shut in with that of Three Castle Point, is a mark for pointing out the western entrance to Bear Haven ; but from the entrance to Puleen, Mizen Head will appear considerably open to the westward of Three Castle Point. The signal-tower on the westernmost height of Bear Island, not far from the entrance, serves more fully to mark out its situation.

Going in at the E. end of the island, the Currigavaddra Rocks, which have a perch erected upon them, form the greatest danger, the easternmost of which lies about half a mile S.-eastward from the E. point of the island, and is never quite covered but at high water spring-tides. These rocks are avoided by keeping nearer to the little island Roancarrig than to the point of Bear Island.

There is no passage between these rocks and Bear Island for any but very small vessels. The channel between Currigavaddra Rocks, and Roancarrig Island is three-quarters of a mile wide, and has from 7 to 17 fathoms in it. Vessels may therefore turn through it without difficulty, having always in view the set of the tides. When rounding the breakers which these rocks occasion, give them a berth of about quarter of a mile, or borrow within that distance of Roancarrig Island ; and then haul to the westward into the haven, giving the E. end of Bear Island a fair berth in passing, and anchor in mid-channel, in from 6 to 10 fathoms. Here the light on Roancarrig will be found of the greatest service, in enabling vessels to find a secure anchorage in the night.

If necessary to pass between Roancarrig Island and the little island lying a quarter of a mile northward of it, keep nearer to the former, to avoid the foul ground which runs off from the S. side of the latter, nearly half-channel across.

DUCALIA ROCK lies half a mile E. by S.  $\frac{1}{2}$  S. from Roancarrig Island, and covers at 4 feet flow. To avoid this rock on the S. side, keep the point of Rinmore on with the sharpest-topped distant hill eastward of the head of the bay.

Bear Haven, by its proximity to the sea, and situation on the western coast of Ireland, at 5 leagues from Bantry, must be esteemed an excellent rendezvous for a fleet, having two entrances, great space and a moderate depth of water on good holding ground. It is easy of access, and well sheltered from all winds, and in a country abounding with many necessary refreshments.

Its western entrance, being narrow between the steep cliffs, ought only to be tempted with a leading wind ; but ships may at all times work in or out of the channel.

Head is the S.W. point of Bantry Bay, and separating that from Dunmanus



Bay. Off the pitch of the head, a short distance, is a small shoal called the Bullig, of 3 fathoms, that breaks in bad weather.

**DUNMANUS BAY** has deep water and clear ground nearly as far up as Manin Island, at the head of it; but it is quite exposed to westerly winds, and little frequented, except by small vessels, that can ride in Dunmanus Creek, or above Manin Island. In Dunmanus Creek you should anchor nearest the W. side, in 3 or 4 fathoms. At Maning Island, anchor at about a cable's length E.S.E.  $\frac{1}{2}$  E. from the island, in 9 feet at low water, on soft mud. In summer large ships may ride on good ground anywhere above Carberry Island, especially on the S. side, near Casilean Hill.

At about a quarter of a mile W. by N.  $\frac{1}{2}$  N. from the N.W. point of Carberry Island, is a rocky shoal of 8 feet, very narrow from N. to S., and generally discernible by the swell of the sea, which, in strong westerly winds, breaks violently. The top of Casilean Hill on with the N.W. point of Carberry Island will carry you to the northward of it; and the three hummocks on with the middle of Carberry Island, will take you to the southward of it. Another shoal extends from the small island to the eastward of Carberry, about half-way to Carberry Island; on this shoal are 5 or 6 feet at low water. On the N. side of Four-mile Water Creek is Carignaronky Rock, dry at low water. Between Furze Island and Horse Island is a rocky ledge, extending almost over, and covered about an hour before high water. Sugach is a rock, about a cable's length from the shore, below Dunkelly Houses, and on which are but 6 feet at low water, spring tides.

**MIZEN HEAD** lies about 12 miles N.W. by W., from Cape Clear, and Three Castle Head  $2\frac{1}{2}$  miles N. from Mizen Head. Mizen is very conspicuous when seen from the westward, being rendered so by the sharp peak, which is 755 feet in height; but the point is steep-to and clear of danger beyond a cable from the rocks. Three Castle Head is rendered remarkable by a castle on it, with three towers. Sheep Head lies N. by E.  $\frac{1}{2}$  E.,  $3\frac{1}{2}$  miles from Three Castle Head. The two heads last mentioned form the entrance of Dunmanus Bay.

**BULLIG ROCK.**—About half a mile W.  $\frac{1}{2}$  S. from Three Castle Head, lies a sunken rock, with only 12 feet on it at low water, spring tides. Here the sea, in boisterous weather, breaks very heavily. By keeping Hungry Hill ever so little open to the westward of the pitch of Sheep Head, you will pass considerably to the westward of it; and by opening out Bird Island (a great rock in Dunmanus Bay) three times its own apparent breadth northward of Three Castle Head, you will pass to the northward of it. The S. side of Bird Island, touching Three Castle Head, is the mark for the centre of the rock. There are several other rocky heads between this breaker and the land, with different depths of water over them; therefore, it is not safe to pass between either.

Barley Cove is a small inlet between Brow Head and Mizen Head, which, when viewed from the offing, has the appearance of a good harbour. There is, however, no safety in it with any wind, particularly from the westward. There is a rock directly in the centre of it, which shows occasionally, as well as some others in the vicinity; but the western shore, close to Mizen land, is pretty clear.

Brow Head lies 3 miles to the westward of Alderman Head, and the coast is mostly steep-to, having from 15 to 20 fathoms within a quarter of a mile. But there are some sunken rocks to the westward of Brow Head, as well as to the S.-eastward of Mizen Head. You will clear these rocks to the southward, by keeping Leamcon tower in one with, or open of Alderman Head, until Three Castle Point appears open to the westward of Mizen Head.

**FASTNET ROCK**, on which a light-house has been constructed, lies nearly  $3\frac{1}{2}$  miles W.  $\frac{1}{2}$  S. from Cape Clear, and rises 93 feet above the level of the sea. The bottom westward, southward, and N.-eastward of the Fastnet is both shoal and rocky, particularly to the N.-eastward. In this latter direction there is a flat rock, at the distance of 400 yards from the Fastnet, having only 11 feet over it at low water. The long eastern mark for it is Baltimore Tower appearing in one with the highest part of the Black Rock, which forms the S.-western end of Cape Clear Island; therefore, when navigating near the Fastnet, do not approach it nearer than a mile. The Mizen Peak on with Brow signal-tower, leads through midway nearly

between the Fastnet and the Cape. The Peak, if kept open to the westward of Brow Head, will lead you half a mile to the S.-westward of the Fastnet. These marks may be very useful in the event of a partial fog, to which this part of the coast is very much subject. Between the rock and Cape Clear are from 12 to 35 fathoms; close to the former 12, and to the latter 24 fathoms.

**Light.**—The light-house erected on this rock shows a bright revolving light every minute. The light is elevated 148 feet above high water, and is visible 18 miles. In the middle of the light-house a broad horizontal red belt is painted.

**CROOKHAVEN** entrance lies  $7\frac{1}{2}$  miles N.W.  $\frac{1}{2}$  N. from Cape Clear, in the western district of Long Island Bay. The harbour is narrow but well sheltered, and convenient for vessels bound eastward; the ground is good, and the water sufficiently deep for large ships. Off the point, on the S. side of the entrance, lie some rocks. To avoid them, keep the summit of Ballydivlin Hill between two points of land on the N. side of the entrance—or rather on with the easternmost of the two, until you open the haven, which lies nearly E. and W. The best anchorage is opposite the houses on the S. side, and about  $1\frac{1}{2}$  mile from the entrance. Ships drawing above 16 feet may anchor about half a mile up from the mouth of the harbour in 4 fathoms. As there cannot be any sea in the haven but with easterly winds, it will therefore be proper for ships that do not go above the peninsular to moor N.N.E. and S.S.W., that they may, when the wind is easterly, ride by both anchors. The N. anchor should lie either on the shore or very near it. The ground all over the harbour is soft mud; and vessels that lie above the houses of Crookhaven may take the ground about half-ebb, without the risk of damage. Pilots are always ready, and will come off in any weather when signalled. Southward of Crookhaven, ships may anchor in from 20 to 30 fathoms.

**Beacon.**—**ALDERMAN ROCK**, part of which is always above water, lies off Alderman Head, on the southern side of the entrance, and is of some considerable extent. On the eastern point of the rock a beacon is erected.

**GRANNY ROCK**, the only one within the harbour, lies off Granny Island, and shows at low water, great spring tides. The long eastern mark for this rock is Leamcon tower just open to the southward of the bluff point of Rock Island. Vessels, therefore, of any burthen, in the event of loss of anchors, may boldly run quite up the haven, until they take the ground by keeping in mid-channel.

**Light.**—A light-house is erected on Rock Island Point, at the northern side of the entrance to Crookhaven, from which a fixed light is exhibited, elevated 67 feet, and visible 13 miles.

This light shows white towards Long Island Sound, and towards the inner part of Crookhaven; but it will appear red in the direction of the Alderman Rock and Streek Head, or when seen between the bearings of N.W. by W. and N.  $\frac{1}{2}$  E. Vessels, therefore, entering Crookhaven, when passing these rocks, should keep northward of the limit of the red light, which is visible 10 miles.

**Directions.**—When running from the offing for Crookhaven (the opening to which cannot be made out till very near Alderman Head), steer in from the Fastnet Rock N., keeping the latter rock due S. as near as may be, until Mizzen Peak comes on with Alderman Head. In proceeding thus you cannot be deceived, because, at the same time, or nearly so, Mount Gabriel will appear in one with Leamcon signal-tower and castle to the N.-eastward; and Brow Head with its signal-tower will appear to close in with Alderman Head to the westward. The harbour will now begin to unfold itself, the revenue officers' houses, on the northern shore, will be seen, and ultimately, Coghlan's tower on the S. side. The light-house will also point out the northern side of the entrance.

When you have fairly opened the harbour, run right in, keeping directly in mid-channel. The signal-tower on Brow Head, three times its own apparent breadth open to the northward of O'Driscoll's house (a remarkable white house on the eastern part of the peninsula, and standing by itself), bearing W., will lead to the northward of Alderman Rock, and into the fairway.

A vessel cannot enter Crookhaven unless the wind is to the southward and eastward of S.S.W. or to the eastward and northward of N. by W.; but when it is,

foul for Crookhaven it will be fair for Long Island Sound. You may anchor, with northerly and westerly winds, a mile to the N.-eastward of Alderman Rock, on very good ground, taking care to provide against a southerly wind.

**CAPE CLEAR** is the southernmost promontory of Ireland, taking its name from the island of which it is a part. It bears from the Longships light-house about N.W. by N., and is distant from it 54 leagues.

On the N. side of Cape Clear Island, above a mile from shore, vessels may anchor in moderate weather. There is a passage between Cape Clear Island and the Sherkin Islands, called Gascanane Sound, which derives its name from two rocks nearly in the middle of the Sound, having a channel on each side of them; but no stranger should attempt this passage under any circumstances, unless during daylight; even then it may be considered dangerous, and the tide runs very strong. Those only who are well acquainted should attempt it; therefore, if caught with a gale of wind from the southward, between Cape Clear and the Stags, a knowledge of Baltimore Harbour becomes of the greatest importance.

**TIDES.**—The tides on this part of the coast flow until 3h. 45m., and the stream of flood continues to run along Mizen Head for 2 hours later. The flood-tide sets from the N.W. along the coast, and the ebb from the S.E. In the Offing, about a league from the shore, the strongest spring-tides do not run above  $1\frac{1}{2}$  mile an hour. Within a mile of Mizen Head, the tide of ebb, or western stream, runs  $3\frac{1}{2}$  miles an hour, and commonly makes a rough sea.

**LONG ISLAND SOUND** is well sheltered, of easy access, and capable of receiving large ships, which may enter at either end of Long Island, and anchor anywhere on good ground; but be careful to avoid a spit of sand which runs off about half a mile within the E. end of the island, and extends northward more than half over the channel. The least water on it is 3 feet, and named Cush Spit. In entering this harbour at the W. end of Long Island, you need only to give the N.W. point, opposite Goat Island, a berth of about a cable's length, to clear the Sound Rock, which covers at half tide.

The three principal passages into Long Island Sound are, one from the south-westward, named Man-of-War Sound, between Goat Island and Turf Island; one between Goat Island and Long Island, named Goat Island Sound; and the eastern passage, between Long Island and Castle Island, which may be taken without a pilot.

**Buoys.**—A conical buoy, painted red, is placed in 10 fathoms, at low water, off the S.W. edge of the Amelia Reef, which extends off from Castle Island at the E. entrance of Long Island Sound. This buoy lies with Rincolisky Castle E. by S.  $\frac{1}{4}$  S.; Copper Point N.N.W.  $\frac{3}{4}$  W.; old light-house tower on Cape Clear S.  $\frac{1}{4}$  W.

A black can buoy is placed in 5 fathoms at low water, off the N. end of the Cush Spit in Long Island Sound, with Leamcon Telegraph tower N.W.; the Perch in Scull Harbour E. by N.  $\frac{1}{4}$  N.; and Scull Point N.E. by E.  $\frac{1}{4}$  E.

**The S.E. PASSAGE.**—**Directions.**—Coming from the westward, and intending to enter the Sound by this passage, run along the southern side of Long Island, giving the shore a berth of rather more than a quarter of a mile. By keeping thus near to the latter island, you will avoid the Amelia Reef, on the eastern side of the channel. Having rounded the eastern point of Long Island, you must, if in a large vessel, anchor as soon as the eastern end of Cape Clear Island comes in one with the said point, bearing S. by E.  $\frac{1}{4}$  E.; taking care also not to shut in the tower of Brow Head with the southern side of Gun Point and Coney Island, in order to avoid the spit of sand before described, which projects from Long Island, and which, partially drying, divides the eastern from the western anchorage; and also to avoid a rock which lies in the mouth of Scull Harbour, marked by a perch.

**The S.W. PASSAGE.**—When entering by this passage, you have merely to keep in mid-channel, and preserve that precaution all the way through, as well as from thence to the anchorage.

When entering the passage between Goat Island and Long Island, it is necessary to keep two-thirds nearer the former than the latter, until you have passed the rocky ledge which runs out in a N.-westerly direction from Long Island. You will be to the northward of this ledge when Coghlan's Tower, at Crookhaven, appears in one

with the northern side of the high wedge-shaped rock, called Green Island : you must then proceed in mid-channel until you reach the anchorage. The ground is everywhere a soft cohesive mud, and the depth varies from 2 to 7 fathoms. It is high water, full and change, at 4 o'clock ; and the greatest vertical rise and fall of water in the Sound, after a series of moderate weather, is 12 feet.

A very dangerous sunken rock, on which there are only 3 feet, lies about half a mile W.  $\frac{1}{2}$  N. from Turf Island. In boisterous weather the sea breaks tremendously upon this rock, as well as on the rocky heads in its vicinity. By keeping the Mizen Peak in one with Alderman Head, or by keeping Castle Island in sight to the southward of Goat Island, you will pass considerably to the southward of them.

**SCULL HARBOUR** lies to the N.N.E. of Cape Clear Island, distant 5 miles. It is pretty well sheltered, the ground good, and the water in the anchorage from 2 to  $3\frac{1}{2}$  fathoms. There is only one rock to be avoided, which lies in the middle of the entry, and is dry at 2 hours' ebb, and is marked by a perch. The mark for this rock is the western end of the Western Calf in one with the eastern end of Long Island ; and when the southern bluff of Brow Head begins to shut in with Gun Point, you are very near its southern edge.

Scull Harbour is not so good an anchorage as Long Island Sound, being more exposed to the swell raised by S.-westerly winds, and the ground is not so good. The best time to enter is at, or after half-flood, as the rock in the entrance is then seen above water.

**BALTIMORE HARBOUR** lies about  $5\frac{1}{2}$  miles to the N.-eastward of the N.E. end of Cape Clear Island, and is very convenient for ships bound either eastward or westward. The entrance lies between Baltimore or Beacon Point on the eastern side, and Sherkin Island or Barrack Point on the western. These points being high and nearly perpendicular, and the land within being also elevated, and presenting nearly the same aspect to an observer in the offing, the mouth of the harbour is not easily made out at any considerable distance. There is, however, a fine stone beacon erected on Beacon Point, and a ruined house, or fort, appears on the summit of the western point, which serves to mark the entrance, as does also the Telegraph Tower, a mile to the eastward of the entrance, above Spain Point. The Fastnet Rock kept in sight to the eastward of the S.E. end of Cape Clear Island, will lead within half a mile of the entrance. Small vessels may ride 2 or 3 cable's length to the N.N.W. of Baltimore town, in 8 or 9 feet at low water, quite sheltered from all winds. Large ships may lie off the old castle on Sherkin Island, in 3 or 4 fathoms, where the harbour's mouth is open.

The rocks in this harbour are the Loo, Quarry, Lousy, and Wallis Rocks on the eastern side, and two small ledges of sunken rocks on the western side, under Sherkin Island. The Loo Rock, on which a black buoy is placed lies about a cable's length N.W.  $\frac{1}{2}$  N. from the high cliff, which has a turret on the E. side ; it is dry at 4 hours' ebb, and may be avoided by keeping in mid-channel. The Lousy Rocks appear at half-ebb, lie nearly N. by E.  $\frac{1}{2}$  E. from the turret on the cliff, and known by a perch on them. These rocks have shoal water on the W. and N. sides, nearly a cable's length from the perch. The Quarry lies 2 cables' length N.E. of the Loo Rock, with 15 feet around it. The Wallis lies off the town at  $2\frac{1}{2}$  cables' length E.  $\frac{1}{2}$  S. from the perch on the Lousy Rocks and has a buoy on it.

**Directions.**—To enter this harbour for which you must have a leading wind, steer boldly in, N.N.E.  $\frac{1}{2}$  E., keeping one-third of the whole distance across nearer to the western than to the eastern point, until the ruined abbey, which stands in a small bight in Sherkin Island, bears N.W. by W.  $\frac{1}{2}$  W. ; then anchor, as nearly in mid-channel as circumstances will permit. By keeping one-third nearer to the western than to the eastern land, you pass to the westward of the Loo ; and when Baltimore New Church appears in sight over the sandy beach on the starboard hand going in, you will be considerably to the northward of, or within that rock. There is always a ground-swell in this harbour when the wind prevails between W. by N. and S.E., which increases very considerably in boisterous weather. The watering-place is at Baltimore Town. Small vessels may proceed through the Sound on the N. side of Baltimore Harbour to the River Ilan and thence to Skibbereen.

**TIDES.**—It is high water, full and change, at 4h. 23m., and springs rise 11 feet, neaps 8½. The flood sets in through the entrance, and the ebb as directly out.

In the entrance of Baltimore Harbour are from 12 to 14 fathoms; between it and Cape Clear are from 18 to 28 fathoms, clean sandy ground, and clear of rocks; and about 2 leagues from the land are 50 fathoms. The space between Cape Clear, Long Island, Crookhaven, and the Fastnet, is perfectly free from danger, though in boisterous weather the sea breaks in some places violently, caused by the rough elevations of the ground.

When coming in from sea towards the land, neither Long Island or Goat Island can, in the first instance, be clearly discerned, owing to their proximity to the mainland, with which, indeed, they appear to be identified. If you keep Fastnet Rock S.S.W. ½ W., or Leamcon high tower N.N.E. ½ E., it will lead directly to Goat Island; and as you proceed, will open the passage, eastward and westward thereof. Mount Gabriel, in one with Leamcon Tower and Castle, bearing E.N.E., will open the western avenues; and the S.-western end of Cape Clear Island, kept just open of the S.W. end of the Western Calf Island, bearing S.W. by S. ¼ S., will lead to the S.E. passage between Long Island and Castle Island, and to the entrance of Scull Harbour.

The Stag Rocks lie 9 miles, E. by S. from Cape Clear; 3½ miles S.W. by W. from the entrance of Castlehaven Harbour; and W. ½ N., 11 miles from Galley Head. There is a very good and safe passage between these rocks and Toe Head, called Stag Sound, keeping rather nearer to the Stags than to the land, in which there are 13 to 21 fathoms. Ships may anchor in Scullane Bay on the E. side of Toe Head, or in the bay on the W. side, or in Barlogue or Tragomna Bay, about half a mile from the shore. There is a patch, with only 4 fathoms on it, named Carrigavilya, lying about a mile W.N.W. from Toe Head; it has 11 and 16 fathoms close to it.

**CASTLEHAVEN HARBOUR** is fit for vessels drawing not more than 12 feet; these must lie about a quarter of a mile above Reen Head, with the Stags of Castlehaven in sight between Horse Island and the main. When the wind does not blow hard from the S. or S.E., vessels may ride in the bay, off the town of Castlehaven, in 4 or 5 fathoms; and it gradually shoals to 2 fathoms, or less, as you proceed up the harbour. Horse Island lies half a mile to the S.W. of Castlehaven, and has a tower erected on the N.E. point; and Black Rock, a sunken rock lies just to the S.-eastward of the island; do not attempt the channel within either of these.

The leading mark into Castlehaven is a hut on the western side of the entrance on with a mound of stones near the shore, bearing N. ¼ W.; and when past Reen Point, haul to the N.E.; you may anchor abreast of Castle Townsend, in 9 feet at low water; springs rise 11 feet, neaps 8.

**GLANDORE HARBOUR.**—About 3½ miles to the eastward of Castlehaven is Glandore Harbour; and about a mile to the northward of the harbour's mouth, and nearly in the middle of the channel, are four small rocks, called the Dangers, on which perches are erected; the southernmost of them is dry at half-ebb, and the northernmost appears at 4 hours' ebb. On each side of these rocks is a channel, sufficiently deep for large ships: that on the west side is reckoned the best, because there is a mark to lead through it, which is the E. extremity of the Little or Eve Island, next to the Dangers, on with the W. extremity of Adam Isle. In proceeding along the E. side of these rocks, keep about half a cable's length from the shore.

Near the head of this harbour vessels may lie very safely, off Ballincalla, although there are but 8 or 9 feet at low water, spring tides, on soft ooze, which prevents their receiving damage. About high water, neap tides, ships of 12 feet draught may run up a cable's length or two above the house of Ballincalla, and lie there safely on soft mud, opposite the quay and coast-guard station.

Folinashark Head, the eastern point of the entrance to Glandore Harbour, lies N.W. ½ W., 5 miles from Galley Head, and is remarkable by having a tower upon it 259 feet above the sea level. Adam Island on the W. side of the entrance is about 100 feet high, the channel between them nearly half a mile wide; high water, full and change, at 4h. 20m.; springs rise 11 feet, neaps 9 feet.

[E. CHANNEL.]

Between Adam Island and Sheela Point is a sunken rock, with only 11 feet on it at low water. To avoid it keep one-third of the distance from the island.

The BELLY ROCK, just awash, lies a quarter of a mile S. of Rabbit Island, and in the track of coasters passing between it and High Islands; the mark to clear it on the S. side is to keep Castle Freke open of Downeen Point, bearing E. Sheela Point open to the eastward of the Beanstack, N.E.  $\frac{3}{4}$  N., leads to the eastward of it. On the N. side of High Islands a vessel may anchor to stop a tide, in 7 and 8 fathoms.

GALLEY HEAD is the eastern point of Glandore Bay, and is 122 feet in height, and makes like an island when made from the east or west. On the low neck which connects it with the main are the ruins of Dundeady Castle.

Light.—A light-house is erected on the extreme point of Galley Head. The light is 174 feet above the sea, and visible 19 miles. A group of six or seven flashes, in quick succession, will appear every minute; the time occupied by these flashes will be about 16 seconds, and the interval of obscurity about 44 seconds. Position, lat.  $51^{\circ} 31' 47''$  N., long.  $8^{\circ} 57' 7''$  W.

ROSSCARBERRY HARBOUR, &c.—About  $3\frac{1}{2}$  miles N.N.W. from Galley Head is Rosscarberry Harbour, a small creek, which sometimes affords shelter to small vessels, but only in very moderate weather, with off-shore winds. The entrance is dry at low water, and is rough and dangerous at high water, when the wind is on the shore. There are 10 feet on the bar at high water, spring tides, and 8 feet with neap tides. With off-shore winds and moderate weather, vessels may anchor on the W. side of Galley Head, between it and Rosscarberry Harbour, and also several miles to the westward in Rosscarberry Bay, on clean ground, about half a mile or a mile from shore.

About half a mile to the westward of Galley Head lies Dhulic Rock, which dries about half-ebb, and on the E. side of the head are the Clout Rocks. A cluster of rocks called the Robares, or Robber Rocks, lies W.S.W., distant  $2\frac{1}{2}$  miles from Galley Head, and W.  $\frac{1}{2}$  N.,  $11\frac{1}{2}$  miles from the Seven Heads; they are under water, but we are uncertain whether they are dangerous; they are marked 8 fathoms, but said to carry only 4 fathoms over them.

Dirk Bay lies to the westward, about a mile N.E. of Galley Head, and has from 4 to 6 fathoms in it.

CLONAKILTY HARBOUR is about  $5\frac{1}{2}$  miles to the E.N. eastward of Galley Head, being fit for small vessels only; and going either in or out when the wind is southerly, is very dangerous. There are but 2 feet on the bar at low spring-tides; and none should run for the harbour in blowing weather, unless under great necessity, and with three-quarters flood. The entrance is on the E. side of Inchydoney Island, and the channel lies near the main. On the N. side of Ring Point, is a rock, which extends to the edge of the channel. You should anchor near the main, opposite the E. end of the island, in the bight next above the narrows, or on the N. side of the island. The other channel along Muckruss is only fit for boats. In the middle of Clonakilty Bay, about a mile southward of Ring Point, a vessel may stop, with the wind off shore, in 9 or 10 fathoms. High water, full and change, 4h. 30m.; springs rise 11 feet, neaps  $8\frac{1}{2}$ .

DUNWORLEY BAY is a deep bight, lying 2 miles westward of the Seven Heads, having 4 to 6 fathoms in it; near the middle of the entrance are two rocks, named the Horse and Cow; the former is awash, and the latter uncovers 7 feet. About half a mile outside the Cow Rock are two other patches of 4 and  $4\frac{1}{2}$  fathoms, named the Cod and Pollock, having 9 fathoms close to them.

COURTMACSHERRY BAY.—From the Seven Heads the bearing and distance to the Old Head of Kinsale are E.  $\frac{3}{4}$  S., about 7 miles. Between them is Courtmacsherry Bay, in the N.-western part of which is Courtmacsherry Harbour.

In Courtmacsherry Harbour small vessels may lie very safe near the quay, in 2 fathoms. As the water is shoal off the point next the quay, vessels drawing 8 or 9 feet must have half-flood to go in. About a quarter of a mile E. of this place, in a small bight, formed by a perpendicular clay cliff, a vessel may stop, in  $1\frac{1}{2}$  or 2 fathoms: but as the channel is narrow, and the tide rapid, one anchor must lie on

the shore. The channel from the extremity of Courtmacsherry Point to these anchorages, is not above one-third of a cable's length from shore.

On the N. side of Courtmacsherry Bay are several rocks and shallows—the Blue Boy, the Barrel and the Black Tom. These lie  $1\frac{1}{2}$  mile from the N. shore, and about the same distance eastward of the Horse Rock. Between the Barrel and the N. shore, is a large patch of foul ground, called the Inner Barrels, with only 2 or 3 feet on them: and half a mile further eastward is the Breen Rock, of 15 feet. The Barrel lies near the middle of the bay, and uncovers 7 feet at low water, spring-tides. On this rock a perch is erected, which serves as a good mark to keep clear of the other shoals.\* The Blue Boy lies 4 cables E.S.E. of the perch, and Black Tom lies 6 cables W. by N.  $\frac{1}{2}$  N from it, and has only 9 feet on it at low water. The Horse Rock, off Barry Point, is awash at high water, and may be approached on every side within three-quarters of a cable's length.

The best passage to this harbour is to the westward of the Black Tom and the Barrel Perch, and eastward of the Horse Rock. The leading mark in, is the top of Burren Hill, shut well in behind Land Point, N. by W.  $\frac{1}{2}$  W.; this leaves the barrel perch and all the shoals on your starboard hand, and the Horse Rock on the port. Coolmain Point, N. by E., leads in to the eastward of the Coolmain Patch, of 20 feet; when within it steer for Land Point, the S. point of the harbour. It is high water at 4h. 36m.; springs rise  $10\frac{1}{2}$  feet, neaps  $8\frac{1}{2}$ .

Vessels may anchor, with westerly winds, on the W. side of Courtmacsherry Bay, either off the Officers' Houses, S.W. from the Horse Rock, in Seven Heads Bay, in 8 or 10 fathoms, or to the northward of the rock, in Broadstrand Bay, in 4 or 5 fathoms.

**KINSALE OLD HEAD** lies E.  $\frac{3}{4}$  S. from Seven Heads, and 15 miles W.S.W. from the entrance to Cork Harbour, and is a bold clifty headland, projecting far to seaward, the outer portion being 256 feet in height, and appears almost isolated. A new light-house was erected on the S. point of the head in 1853, distant half a mile S.S.W.  $\frac{1}{2}$  W. from the former light-house, the light of which is discontinued. This old light-house is the southern one of the two white-washed towers, the northern being built square; between them are the ruins of a castle.

**Light.**—The light-house (on the S. point of the head) exhibits a fixed light, visible 21 miles. The building is white, with two red belts, elevated 236 feet above high water and 100 feet in height. A streak of red light is shown across Courtmacsherry Bay, between a line drawn to the Seven Heads, and a line to the Horse Rocks, otherwise the light is of the natural white colour.

**KINSALE HARBOUR** lies  $4\frac{1}{2}$  miles N.E. by N. from the Old Head, and although narrow at the entrance and all the way up to the town, is a very safe harbour for the smaller class of vessels. In sailing towards it from the southward, keep Knockmoldown Hill N.E. by E., until you see the Old Head of Kinsale. After making the light-house on the head, run in, until it bears W.N.W., about 3 miles; then N.W. until it bears S.W., from whence steer N.E.  $\frac{1}{2}$  N. until you are abreast of the lower cove, where you may anchor in 6 fathoms.

The dangers on entering the harbour of Kinsale are Bulman Rock on the starboard side, on which a black buoy is placed, and the Farmer Ledge on the port; the former lies little more than a cable's length S.S.W.  $\frac{1}{2}$  W. from Hangman's Point, on the E. side of the entrance, and has 3 feet on it at low water. You may pass this rock on either side; but the channel on its W. side is the broadest, and most safe for ships coming in or going out. When going in, after passing this rock to the westward, keep in towards the eastern shore, until you are up to the bar. To go between the rock and Hangman's Point, keep Sovereign's Isles a boat's length open of Frower Point. To avoid it on the S. side, keep Oyster Haven Rock open of the same point; and to keep clear of it when going in on the W. side, keep Fort Charles, Church, and light-house open of Prehaun and Hangman's Point; and by not bringing that Fort within its own apparent breadth of Money Point, you will avoid the Farmer.

\* On the occasion of this beacon being washed away, a black buoy is placed to mark the position until the beacon is replaced.

**Harbour Light.**—On Fort Charles, E. side of harbour, a fixed light showing a bright flash for 15 seconds, is exhibited, 98 feet above the sea, open to the harbour in a N.E. by N. bearing, and may be seen in clear weather, 14 miles off.

There is a bar a little to the southward of Fort Charles of only 12 feet at low water, spring-tides, on one patch, but the general depth is 14 to 15 feet; therefore, ships that arrive at low water, and draw more than 12 feet must stop an hour or two, until the water rises a little, before they proceed. You are over the bar and in deep water, when going up, with Charles's Fort bearing E.S.E.

The common anchorage is off the Upper Cove, a little more than a cable's length from shore, in 4 or 5 fathoms; but there is water enough for the largest ships to anchor above the cove, anywhere in the channel of the river, which lies close along the eastern shore, and is not above a cable's length wide, until you get near the town of Kinsale, where the channel is broader: and in the anchorage off the town are 6 to 7 fathoms.

To go into Kinsale Harbour in the night, keep the light on the Old Head S.W.  $\frac{1}{2}$  S. and the light in Fort Charles N.E. by N.; or when the Old Head light is right astern, keep the light in Fort Charles on your port bow. But as these lights are the only guide, it will be more prudent to keep an offing until daylight, or till a pilot can be obtained. It is high water, full and change, at 4h. 43m.; springs rise about 11 $\frac{1}{2}$  feet, neaps 9 feet.

**OYSTER HAVEN.**—About 2 miles to the eastward of the entrance of Kinsale Harbour is a creek, in which small vessels under 13 feet draught may find shelter at low water. On entering this haven, it must be noticed that a shoal runs from Kinure Point, the E. point to the harbour, nearly half a cable's length beyond high water mark, called the Sovereign Patch, of 9 feet.

The Little and Big Sovereign Islands lie without the entrance, half a mile apart. On entering, pass midway between them, and keep nearest the port shore or Ferry Point, to avoid the Harbour Rock, of 4 feet, which lies E.S.E.  $\frac{1}{2}$  E., 1 $\frac{1}{2}$  cable's length from the point. You may pass on either side of the Big Sovereign; but if you pass to the westward of it, give Ballymacus Point, on your port hand, a berth of 1 $\frac{1}{2}$  cable's length, as a spit of 13 feet runs off it to the eastward nearly to that distance. The best place for anchoring is on the W. side, in the mouth of that branch which runs to the westward; here you may find 16 to 17 feet, with Ferry Point, S. by W. to S.S.W., 1 $\frac{1}{2}$  cable's length. About 2 cables' length E. of Ferry Point are 20 feet, but open to S.W. winds.

CAPTAIN M. WHITE says, "This haven, though it presents an inviting entrance, is merely a creek or inlet of the sea, and will not afford any shelter with the wind from between the S. and W. to vessels drawing 8 feet; and these must occasionally lie aground. Winds in the above direction send in so heavy a sea, as to render riding in the harbour's mouth actually impracticable."

The DAUNT ROCK is a pinnacle with 10 feet water over it having for its base a rocky bed of about a cable in diameter. It is 6 miles E. of Oyster Haven, and about three-quarters of a mile S.E. by S. from the extremity of Robert Head (on which is a signal tower), and S.W.  $\frac{1}{2}$  W., 4 $\frac{1}{2}$  miles from Roche Point light-house. As this rock lies nearly in the fairway of vessels passing between Cork and Kinsale, it must be carefully avoided. Cuskinny House, in Cork Harbour, kept in sight to the eastward of the point of land under Fort Camden, leads to the eastward of it. The leading mark between the rock and Robert Head, is the Little Sovereign in one with Reanie Head, W.  $\frac{1}{2}$  S., or Temple Breedy Church, seen over Morris Head, bearing N.E. by N.; but this channel is only for coasters and steamers; large vessels should always take the outside course. The Great Sovereign Islet, touching Flat Head, leads midway between the rock and Robert Head. By keeping Robert Head tower in a line with the extremity of Robert Head, you will pass about a quarter of a mile to the southward of it.

**Light-vessel.**—A light-vessel is moored in 14 fathoms, eight-tenths of a mile S. by E. from Daunt Rock, and 4 $\frac{1}{2}$  miles to the S.W. of the entrance of Cork Harbour

*The light is a fixed red light 39 feet above the sea. The light vessel has three*



masts, with a globe at the main-mast head, and a cone at the mizen-mast head, to indicate how the vessel is swung.

From this light vessel Roche point light bears N.E.  $\frac{3}{4}$  N. distant  $4\frac{1}{2}$  miles and Barry head W. by N. 4 miles; these bearings place the light vessel in latitude  $51^{\circ} 43' N.$ , longitude  $8^{\circ} 17' W.$

In foggy weather a gun will be fired twice, with an interval of five minutes, every quarter of an hour.

**Buoy.**—A black buoy is moored to the N.E. of the rock, but is sometimes washed away during southerly gales.

**CORK HARBOUR.**—From the Longship light-house, off the Land's End, to the entrance of Cork Harbour, the course and distance are N. by W.  $\frac{3}{4}$  W., 46 leagues; and from St. Ann's Point, Mildford Haven, N.W. by W.  $\frac{1}{4}$  W., nearly 38 leagues. Coming from the southward, and bound to this harbour, keep Knockmel-down Hill, about N.E. by E., until you see the Old Head of Kinsale, a bluff point of land with a light-house on it. From this head the Daunt Rock bears E. by N.  $\frac{1}{4}$  N., 11 miles, and from thence the entrance of Cork Harbour lies N.E.  $\frac{1}{4}$  N., distant about 4 miles. When off this harbour, Roche Point, with its light-house, on the E. point of entrance, is a remarkable object. A little outside the point, on the E. side of the entrance, lie the Cow and Calf, or Stag Rocks.

This is, excepting Bantry Bay, the only port on the S. coast of Ireland fit to receive ships of the line, which, with a leading wind, may at all times in the day, enter by attending to the marks that lead clear of the harbour Rock and Turbot Bank, both of which have buoys placed on them, as will be seen hereafter.

There is a clean ground and a moderate depth, outside the harbour's mouth, where ships may, with a northerly wind, in from 7 to 10 fathoms, wait for the flood, or daylight.

**The Light-house on ROCHE POINT**, in latitude  $51^{\circ} 47' 33''$ , and longitude  $8^{\circ} 15' 14''$ , exhibits an intermittent white light, showing bright for fifteen seconds, and suddenly eclipsed for five seconds. The tower is white, 49 feet in height, and the light may be seen about 10 miles off. The lantern is about 98 feet above the sea. An additional fixed white light is shown from the same tower, 38 feet below the former, to mark the position of the Daunt Rock.

The white light will be visible 10 miles between the bearings of N.E. by E. and N.E.  $\frac{1}{4}$  N., or between Robert Head and half a mile to the eastward of Daunt Rock. Mariners are cautioned, when approaching Cork Harbour at night, to keep eastward of the limits of the fixed white light until they have passed the rock.

**FOG BELL.**—The fog bell, at Roche Point, will be sounded at intervals of thirty seconds, or twice in each minute during thick or foggy weather.

**Inner Light-house**, near Queenstown, is a pile light-house, erected in a depth of 9 feet at low water, on the N.E. part of Spit Bank, eastward of Haulbowline Island. It exhibits a red fixed light, 32 feet above high water, and is open to seaward and to the harbour from N.N.E.  $\frac{1}{4}$  E. to S.E. by E.  $\frac{1}{4}$  E. A sector of white light is shown over the position of Bar Rock, between the bearings of S.W. by W.  $\frac{1}{4}$  W. and S.W.  $\frac{1}{4}$  S. Masters of vessels are cautioned not to cross the bank between the light-house and Haulbowline Island, and to give the light-house a sufficient berth in passing.

**ROCHE POINT**, on which the light-house stands, may be safely approached to within a cable's length after passing the Cow and Calf (or Stag) Rocks. Dogs Nose, a high point on the eastern shore further in (on which is a remarkable white wall on the face of the cliff, to the southward of the fort, and seen a considerable distance), should have a berth of  $1\frac{1}{2}$  cable's length giving to it in passing. Between these two points is White Bay, where a flat of 3 fathoms runs off full 2 cable's length from the shore.

The western shore of the entrance may be approached to within  $1\frac{1}{4}$  cable's length, until you arrive at the Turbot Rock, to the northward of which a spit runs off, having only 4 fathoms on it, full 3 cables' length from the shore, and on which the first or southernmost red buoy is placed.

The Harbour Rock, of  $2\frac{1}{2}$  fathoms, which is surrounded by a shoal, of 4 fathoms,

to near a cable's length, lies  $3\frac{1}{2}$  cables' length N.W.  $\frac{1}{2}$  N. from Roche Point. This rock lies near the middle of the entrance, and is the first danger to be avoided in going in. There are two buoys on this shoal, lying E. by S.  $\frac{1}{4}$  S. and W. by N.  $\frac{1}{4}$  N. of each other, distant  $1\frac{1}{2}$  cable's length: the eastern buoy is chequered red-and-white, surmounted by a beacon, and the western one chequered black-and-white. The eastern buoy lies with Cuskinny House (a white house very remarkably situated among the trees to the eastward of the town of Queenstown) over the lowest point of land at Dog's Nose.

The Turbot Rock, on which the least water is 19 feet lies one-third of a mile N.N.E. from the Harbour Rock; it extends about a cable's length from E. to W., having 4 fathoms on its outer edges. There are two buoys placed on this shoal, about a cable's length apart, bearing W.N.W.  $\frac{1}{2}$  N. and E.S.E.  $\frac{1}{2}$  S. of each other: the eastern buoy is striped red-and-white vertically, and surmounted by a beacon; and the western one black-and-white vertically.

The channel eastward of the Harbour Rock is considerably narrowed by the flat that runs off the eastern shore, above Roche Point, which leaves the channel of 6 fathoms little more than a cable's length in width. The channel to the westward of the Harbour Rock has from 8 to 11 fathoms in it, and the most room for a large ship to work through. There is a good channel on either side of the Turbot Rock; that on the W. side has 5 fathoms, and the channel on the E. side has 6 fathoms at low-water, and between it and the Harbour Rock are 8 to 9 fathoms.

Between the Turbot Rock and the town of Queenstown there are seven red buoys, which mark the western boundary of the channel, and are to be left on your port hand going in; and between Fort Carlisle and the Bar Rock, at the entrance of the passage to Queenstown, there are six black buoys, on the eastern side, on the edge of the extensive flat that stretches to the N.-eastward; these are all to be left on your starboard hand going in. Between the third and fourth black buoys, and nearly E. from Spike Island, is the Man-of-War Road, where there are 8 to 10 fathoms in the channel. Close to the southward of the fourth black buoy is the entrance of the East Channel, leading to East Passage, and to the town of Ballynacurra.

Bar Rock.—N.E.  $\frac{1}{2}$  E., 2 cables distant from the Pile light-house, is the Bar Rock of 16 feet, marked by a cask buoy in black-and-white stripes. This rock is covered by an arc of white light from the Spit light-house.

Besides the black buoys on the starboard side, and the red buoys on the port side, the channel is pointed out by black-and-white buoys, which are moored in the fairway, and the best course is just to the eastward of them, until you round the Bar Rock, after which you may pass them as most convenient.

Directions.—The capacity of the Ship Channel into Queenstown Harbour is very much straitened by the steep flats on each side, no part thereof exceeding the breadth of the channel between Forts Carlisle and Camden, which is about 270 fathoms; from whence it winds circuitously between the buoys, narrowing at the same time as you proceed northerly; so that no leading mark can be acted upon continuously from the harbour's mouth; though by attention to the buoys and the lead, a vessel may be worked in or out at any time, as at present the channel is well defined by the position of the buoys on the shoals.

Those working in or out of Cork Harbour, should be aware that the tide sets, in the first instance, into the bight formed between Roche Point and Dog's Nose (or White Bay), and thence obliquely across to Cross Haven, whence it is again warped into a N.-easterly direction, which produces corresponding counter-tides and eddies along both shores. The ebb-tide has a directly opposite tendency.

There are good channels on either side of the Harbour Rock and Turbot Bank, or between them.

On coming in, endeavour to pass between Roche Point and the Harbour Rock, or between the latter and the Turbot Bank. The first route may easily be effected, by keeping Cuskinny House wholly shut in with the point at Dog's Nose. This mark also leads to the eastward of the Turbot Bank, in 6 or 7 fathoms.

*Anchorage.*—The best place for large ships to anchor in is the Outer Road, or

between Fort Camden and the buoy of the spit. Or you may proceed further, with Queenstown Church just shut in with the eastern angle of the new citadel on Spike Island, until you arrive at the third red buoy; then keep more to the N.-eastward, and take a position in from 12 to 7 fathoms. The buoys will be your best guide, observing to keep to the eastward of all the red buoys, and to the westward of the black ones. Merchant ships may ride off Queenstown, in smoother water and less tide; they may also go further up to the Harbour of Passage, and ride anywhere between the first house and Marino Point.

When proceeding towards Cork Harbour from the eastward, the shore should not be approached within half a mile when between Ballycroneen Bay and Roche Point, particularly in the neighbourhood of Poor Head, off which are the following rocks and patches, viz.:—Hawk Rock, having only 10 feet on it, lies S.S.W.  $\frac{1}{2}$  W. from the head, distance 2 cables' length. The Quarry Rock lies 3 cables' length E. of the Hawk Rock, having only 3 feet upon it, with the pitch of Poor Head N.W.  $\frac{3}{4}$  N., distant 3 cables' length. The Pollock Rock of  $4\frac{1}{2}$  fathoms, lies with Poor Head bearing N.W.  $\frac{3}{4}$  N., distant  $1\frac{1}{2}$  mile; and in Ballycroneen Bay there is a patch of foul ground, lying full half a mile from the shore, having only  $7\frac{1}{2}$  feet on it; this lies with Poor Head bearing W., distant 2 miles. E.  $\frac{1}{2}$  S.  $7\frac{1}{2}$  miles from Poor Head is Ballycottin Island, with Ballycroneen and Ballyandreen Bays between; shoal water borders the shore for 1 or 2 cables' length; and about 6 miles E. of Poor Head is the Wheat Rock about 3 cables from shore, which uncovers at 4 hours ebb; the Dog Rock close to shore, and Smith's Rock, nearly half a mile from shore, which uncovers at low springs; this latter is marked by a black beacon buoy lying W. by S.,  $1\frac{1}{2}$  mile from Ballycottin Island and E. by S. from Poor Head. The mark to clear this rock is to keep the whole of Capel Island open to the S. of Ballycottin Island bearing E. by N. One-mile-and-a-half off the coast the stream is scarcely perceptible.

**BALLYCOTTIN ISLANDS** lie nearly 6 miles W.  $\frac{3}{4}$  S. from Capel Island. In the Sound, between the two Ballycottin Islands, is a small rock, dry at very low spring ebbs.

**Light.**—A light-house is built on the outer island, W. side of Ballycottin Bay, in latitude  $51^{\circ} 49' 30''$ , and longitude  $7^{\circ} 59'$ , which exhibits a light, flashing every 10 seconds. The lantern is 195 feet above high water level. The light is visible from W.  $\frac{1}{2}$  S. seaward to E.  $\frac{1}{2}$  S., and the flash will be visible 6 leagues in clear weather. The tower is circular and of stone colour. The projecting gallery and blocking under the lantern-sash is coloured red.

There is excellent anchorage within the Bay of Ballycottin, which does not appear to be estimated as it deserves, and where an excellent harbour of refuge might be constructed.

**BALLYCOTTIN BAY.**—The following remarks on this bay were made by Lieutenant Samuel Coulson, R.N., at Ballycottin.

"Three years' observation has convinced me that the mercantile interest has in many instances suffered, in consequence of vessels, when bound to Cork, or ports westward, and obliged to bear up by westerly gales, instead of taking shelter under the high western land of this bay, have run for the dangerous bar-harbour of Youghal, or even further eastward, thereby risking their safety in attempting Youghal, and possibly otherwise causing loss and delay to owners; whereas by taking this bay, they would not only have been within 2 or 3 hours' communication with Cork, by land, about 10 miles distant from the harbour's mouth, but ready to take advantage of the first favourable change.

"The only disadvantage of this anchorage is, that the wind setting in from S.E. to E. (which wind, however, very seldom blows), renders it necessary for vessels to put to sea as quickly as possible. The prevailing winds on this coast are westerly throughout the year; therefore the anchorage is safe and convenient with the wind from S.W. to N.N.E., by the N. Vessels taking shelter here from a westerly gale should anchor with the Government Houses bearing S.S.W. to S.W., and the outer island S.E. to S.S.E., in about 3 fathoms at low water. The bottom is smooth and even, of fine sand and clay, perfectly clean, and holding-ground good.

"The outside island is high, with a bold rocky coast, steep-to, with deep water, and no dangers; so that a vessel in taking the bay from the westward, may round the island close-to, and find herself suddenly in smooth water. A vessel attempting the Sound, should keep the S.E. island close aboard, as there is a dangerous reef of rocks, which shows at low water, from the N.E. point of the island, running out about E.S.E. to about mid-channel. The depth of water through the Sound is from 5 to 7 fathoms."

Capel Island, on the W. side of Youghal Bay, bears from Ballycottin Island flashing light E.  $\frac{3}{4}$  N., distant 6 miles; and from Minehead light W.  $\frac{3}{4}$  S., 12 miles. On Capel Island is a tower 123 feet in height.

**YOUGHAL BAY, BAR, and HARBOUR.**—DIRECTIONS BY H. E. RODERICK, Esq., OF YOUGHAL.—"Ardmore Head forms the eastern extremity of Youghal Bay, and Capel Island and Ring Point its western. Youghal Harbour lies between Cork and Dungarven Harbours, about 5 leagues from the latter, and 7 leagues from the former.

"Across the harbour's mouth is a bar of hard sand (not shifting), free from rocks; but outside, and near it, lies a small patch of rocks, commonly called the rock of the bar, which is always covered, and has, at low water spring-tides, not less than 3 feet on it.

"The rock of the bar is exceedingly dangerous, lying open in the bay, and never uncovered; it lies off the harbour's mouth, about a mile, and outside, near, but distinct from the bar. The bar itself commences outside, and near to the eastern point of the harbour, off a remarkable deeply-indented clay cliff, and near the eastern point.

"The bar runs out to sea from near this cliff, about half a mile, and sweeps away to the westward, first turning, and forming part of a crescent, shoaling gradually in-shore from the western channel; it extends totally across the harbour's mouth. There are two channels over it in use—eastern and western; the western being a channel you may take with a flowing sheet, with in-shore winds; when you will be on a wind (sometimes braced sharply up, and a rocky shore under your lee,) in taking the eastern.

"In running for the harbour, I prefer the western channel, though the eastern may be deeper by a foot or two. In coming out, I prefer the eastern with an in-shore wind. A vessel in the bay may safely stretch across from Capel Island towards Ardmore Head, and a view may be taken of the form of the bay; and the in-shore objects I call attention to. Observe the windmill on the hill, at the W. side of the harbour's mouth, within a field or two of which is Drew's Glen; and down on the beach, beneath the glen, to the W. of the harbour's mouth, stands a small hill or rising ground, about 100 feet high, called Clay Castle, the base of which is frequently washed by the sea at high tide. This hill (lowering every year) and Drew's Glen, back of it, about a quarter of a mile, are most useful landmarks, as will appear presently. Look on the western point of the harbour; inside of which, and near it, stand Green Park stables. Now, to take the western channel, keep these stables (or the angle of the high wall close to them) and the western point of the harbour in a line, and run in for the western point. When you bring Drew's Glen and the highest part of the hill, called Clay Castle, in a line (at your port hand), you are going over the bar, and having passed those marks, you will deepen the water. Give the western point a good berth, and run up the harbour, and anchor abreast of the town, in 6 fathoms at low water.

"Baylee's Glen and the dwelling-house close to it, stand almost at the head of the harbour, on the side of the hill, at the starboard side of the harbour a little. There are trees about it. Carefully remark this glen and house, because, at a short distance to the E. of it, stands another dwelling-house. On Baylee's Glen and house depend much as to the rock of the bar. Opposite the town is a low sandy point called the Ferry Point; and on the inner part of the point is a turret. The eastern point of the harbour lies to seaward of this turret; and a short distance from the harbour's mouth, on its E. side lies a bluff head (a bold shore), called *'eckball Head*. There is an excellent anchorage close to this head, and shelter

in a N. or N.E. gale. Observe also the situation of Ardmore Head ; and Whiting Bay lies between it and Blackball Head.

"When about to enter the eastern channel, look sharp to avoid the rock of the bar. It lies between Blackball Head and Capel Island, being about one-third nearer Blackball Head than the island—say two-thirds from Capel Island and one-third from Blackball Head. The landmarks for the rock are Baylee's Glen, or house, in a line with the eastern point ; and Drew's Glen in a line with the top of Clay Castle. Where these lines intersect one another, is the rock of the bar, over which, and the bar, breaks a tremendous sea, with in-shore gales ; but once over the bar, the harbour is a safe and good one.

"To take the eastern channel, run boldly in for Blackball Head ; and when close in with it, ease away for the western point of the harbour nearly, (give it a little northing,) but keep a handspike's length of Ardmore Head open of Blackball, until you run across the harbour's mouth so far as to see the turret on the inner part of the Ferry Point ; and then run up for the anchorage, giving the port side the preference. The depth of water in the eastern channel, at low water spring-tides, is about 5 to 6 feet ; at neap tides 7 to 8 feet ; and in the western channel say a foot less. A sloop-of-war may, at times, enter Youghal Harbour through the channels ; and vessels drawing 16 feet may pass the bar (of course at high water or near it) in moderate weather.

"The tides rise about  $12\frac{1}{2}$  feet on the spring, and 10 on the neap ; and they rise uniformly by degrees, not unequally. There is no peculiarity in the rise or fall of tides here in the usual weather ; but in strong gales, on or off shore, they are proportionally raised or depressed. Good anchorage may be found close to the N. of Capel Island ; and a vessel may bring up there under the lee of the island, with in-shore winds, and wait a tide to run for the harbour or ride out a gale. In a S.W. gale, Ring Head or Knockadoon Head affords shelter ; and it is clean sandy ground along this headland. When running in from Capel Island to Blackball Head, you are running directly for the rock of the bar.

"To the N.W. of the bay, and inside of Capel Island, lie some patches of rocks, called the Black Rocks, uncovered at half-ebb, but totally out of the track of vessels going into Youghal, yet worthy of remark, as they have proved ruinous to vessels obliged to run on shore. If a vessel must be beached in Youghal Bay, with E., S.E. or southerly gales, the flat strand in the N.W. part of the bay, about half a mile in shore from Capel Island is the best place. In this case of dire necessity, (to save lives) I would close Capel Island, and skirt the western headland (Ring), about 3 or 4 cables' length distant, gradually bringing Capel Island nearly astern, and beach in the midst of breakers. There, owing to the flat nature of the shore, the tide ebbs very far, and there is every chance of escape ; but do not run ashore till you pass the high land on the inner part of Ring Headland. Run for what appears quite flat, under your lee, keeping as close to the western headland as you can ; but do not beach on it. By this course you will beach on the sand, and leave the Black Rocks to the starboard, between you and the harbour's mouth. There is a coast-guard station near to the flat strand.

"In beating to the westward for Youghal Harbour, if it cannot be gained, a gale at S.W. may be cheated, by a vessel coming to an anchor to the E. side of Ardmore Head, as there is good anchorage close along the E. side of it ; however, this remark only applies in case better cannot be done ; no man will anchor there, or beach his vessel, if he can avoid it."

The following leading-marks have also been given for the E. and W. bars of Youghal Harbour, viz. :—

TO CROSS THE EAST BAR.—Bring the farmhouse in one with the cottage on the W. side of the entrance a little southward of the light-house bearing N.W.  $\frac{1}{2}$  N. ; this leads into the deepest water.

TO CROSS THE WEST BAR.—Bring the first hedge E. of Bay View House (E. side of harbour) N.E.  $\frac{1}{2}$  N. ; this leads across the W. bar.

Youghal Harbour Light is situated on the W. side, and within the entrance of the harbour, in latitude  $51^{\circ} 56' 34''$ , and longitude  $7^{\circ} 50' 33''$ . This is a fixed

[E. CHANNEL.]

bright light, open to the harbour and to seaward to S.W. by S. from the light-house, and in clear weather will be seen 6 miles. The lantern is elevated 78 feet above high water.

A red light is exhibited from a window of Youghal light-tower, 2 hours before high water till  $1\frac{1}{2}$  hour after high water, visible from N.E. by N. to N. by E.  $\frac{1}{2}$  E., or through an arc of  $18^\circ$ . A ball will be hoisted during the same period by day.

High water at Youghal, full and change, at  $5\frac{1}{4}$  hours.

**MINEHEAD.**—This headland lies E.  $\frac{1}{4}$  N.,  $5\frac{1}{4}$  miles from Ram Head round tower; and S.W.  $\frac{1}{4}$  W., distant 4 miles, from Helvick Head, the S.W. entrance to Dungarvan.

**Light.**—A conspicuous light-house has been erected on this head, showing an intermittent light, visible in clear weather 7 leagues. It is eclipsed once every minute; appearing in its full brightness during 50 seconds, and obscure 10 seconds. The light is visible when bearing from E. by N.  $\frac{1}{4}$  N., seaward to W.  $\frac{1}{4}$  S. The tower is 68 feet in height, and the lantern 285 feet above high water.

**DUNGARVAN HARBOUR.**—Helvick Head, the S. part of Dungarvan Bay, bears from Hook Point, of Waterford W. by N.  $\frac{1}{4}$  N., distant 22 miles. Vessels drawing not more than 10 feet may here have good shelter, and lie on clean sand when left by the tide: but such vessels should not go in until near high water. In the shoalest part of the channel are 3 feet at low water. At Dungarvan Quay are 14 feet at high water spring-tides, and 9 at neap-tides. At a short distance from the quay the water is 2 or 3 feet deeper. High water, full and change, at 5h. 12m.; springs rise  $12\frac{1}{4}$  feet; neaps  $9\frac{1}{4}$  feet.

Dungarvan Harbour Light, on Ballinacourty Point, the northern side of the entrance channel, is in latitude  $52^\circ 4' 27''$ , and longitude  $7^\circ 33' 5''$ .

The light is fixed, visible from between the bearings of W. and S.E.  $\frac{1}{4}$  S.; coloured green in direction of rocks extending from Ballinacourty Point, between W. and N.W. by W. red in direction of the Carrickapane Rock, and in all other directions will be of the natural appearance; its focal plane is 52 feet above the mean level of the sea, and in clear weather the uncoloured bright light should be seen from seaward, at a distance of about 10 miles.

The tower is circular, of light grey limestone, 44 feet in height, from its base to the top of ball over dome.

**NOTE.**—Minehead intermittent light, 4 miles distant, S.W.  $\frac{1}{4}$  W., from Helvick Head, marks the approach from the westward to Dungarvan Bay, and will be seen further eastward than the range of the Dungarvan Harbour light.

In the entrance of Dungarvan Bay keep clear of the red colour of the light to avoid the Carrickapane Rock; and on the northern side, keep outside the limits of the green colour of the light, to avoid Carricknagaddy, and the rocks which extend half a mile eastward of Ballinacourty Point.

To fall in with Dungarvan Bay, keep Crunach Hill, the westernmost and most tapering of the Dungarvan mountains, N.  $\frac{1}{4}$  E. In the mouth of this bay are two rocks, always above water. The largest called Carrickapane, lies nearly in the middle. You may pass on either side, giving it a berth of half a cable's length. From the other rock runs a ledge, which extends to the shore of Ballinacourty.

**Buoys.**—The rock called the Gainers lies about three-quarters of a mile to the northward of Helvick Head, extending about a quarter of a mile from E. to W., has, with ordinary spring-ebbs, some parts bare, and is marked with a black buoy. About 4 cables' length S.E. of the Gainers lies the Helvick Rock, with only 8 feet over it, and marked by a black buoy. To avoid this rock on the N. side, keep the Knob Hill on with Wyse Point, bearing N. by W.  $\frac{1}{4}$  W., or by keeping within a cable's length of Carrickapane, and giving Helvick Head a berth of about two-thirds of the distance between it and Carrickapane, you will clear both the Gainers and the Helvick Rock, which lies one-third of a mile N. of the point.

A dangerous ridge of sand extends southward along Ballinacourty Point, and dries at low spring-ebbs, stretching along shore to the N.W. as far as Wyse Point, *making the channel very narrow between it and the Whitehouse Spit and Deadman*

Sand. The marks to clear the Whitehouse Spit and lead into the Pool, are the Glebe House (a white house) in one with the round hill, inland, bearing N.N.W.  $\frac{1}{2}$  W. At half a mile E.S.E. from Ballinacourty lies Carricknamoan Rock; and at about 2 cables' length W.N.W. of it lies another, named the Carricknagaddy, leaving a clear channel half a mile between them and Carrickapane.

To wait for the tide to go up to Dungarvan, anchor off the house of Ballinacourty about one-third of a mile from the shore, because there the ground is best. About half-flood, (attempt not to proceed sooner) steer for Ballinacourty Point; and when you are near the house, keeping about a cable's length from that shore and the before-mentioned mark, Glebe white house on with the round hill leads to the Pool; from thence the channel runs W.N.W.  $\frac{1}{2}$  N. for a mile, then N.N.W.  $\frac{1}{2}$  W., half a mile further, will bring you up to the town.

By Mr. Roderick.—“Dungarvan Harbour is very peculiarly circumstanced, as regards the trade of Youghal, Cork, Limerick, &c. It is situated about 14 miles from Youghal, 22 from the Hook of Waterford, and 15 or 16 from the celebrated dangerous Tramore Bay. Vessels bound westward in gales of wind, if they cannot beat up to Youghal, have no other place to run for but Dungarvan between that and Waterford. Hitherto the Port of Dungarvan has not had a good name with seafaring men; but we trust the directions now given will enable us to do away with this prejudice, and show masters of vessels that Dungarvan Harbour affords them an asylum in case of necessity.

“Vessels proceeding from sea should endeavour to make the mountain of Knockmeltdown, about 14 miles inland, and remarkable by its being the highest on that coast, and tapering to a point. The mountain first seen (and brought to bear N.N.W.  $\frac{1}{2}$  W.) will lead them well in; for Helvick Head, which is the southernmost point of Dungarvan Bay and Ballyvoyle Head (taking in Clonea Bay) may be termed the other horn of Dungarvan Bay.

“Ballinacourty Point lies further in to the N., at the starboard hand of the channel. The shore outside and abreast of Helvick, close, is bold, say 8 fathoms. Between Helvick and Clonea, and nearly in the centre of the bay, is a steep rock, called Carrickapane, always well above water, and can be approached with safety all round to within half to a quarter of a cable's length. Abreast of Helvick is a sunken rock, called Carrickatheusa, having only about 8 feet on it at low water, (and in gales the sea breaks over it, though between it and the head is deep water). In going into this bay, you avoid this rock by giving Helvick a berth of one-third the distance between the head and Carrickapane. Inside, and to the N. of Helvick, is a patch of rocks, called the Gainers, with only 2 feet on them at low springs; they lie rather more than a quarter of a mile from the head, and extend about a quarter of a mile each way; between them and the head is a roadstead of good anchorage, where a vessel may ride in 3 fathoms at half a cable's length from the shore.

“In a heavy gale at S.S.W., a vessel may cheat the gale, at least until the tide rises, by rounding in there; but if the wind chopped suddenly round to the N. (not an unusual circumstance) her position would be a dangerous one. The position of the Gainers is quite enough to enable you to avoid them. Near the Ballinacourty shore is another rock, called the Runners,\* also always well above water, from which a ridge of rocks runs to the shore, with no passage there.

“Between this rock and Carrickapane Rock is the Broad Sound, generally used by vessels from the eastward. In beating in or out between these rocks you may near the Runners Rock very close, as it is bold; but give Carrickapane a berth of half a cable's length, and it may be approached all round at that distance. Ballinacourty Point is bold, by giving it half a cable's length from high water mark; and this point is the key to the mouth of the channel, which is very narrow there, owing to a very extensive strand, which runs from the Cunnigar Point (a low tongue of land running out from the western shore almost across to the head of the bay) down almost opposite the lower Ballinacourty Point and sweep away in a

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\* The Runners have been named Carricknamoan and Carricknagaddy.

*exposed to the shore, near Grandison Harbour, at the W. side of the bay. From this low water line up to the Cunnigar is one flat strand; and vessels driven on shore on it, if they hold together for a reasonable time, save lives.*

"*The safest place to beach, if it must be done, at the western side of Dungarvan Bay, is near the inside of Cunnigar Point, where it joins the land. High water must be chosen, or as near it as possible; and the only directions necessary are, to run straight in for the root or inner part of the Cunnigar Point. If she forges well up for that spot, and holds together till the tide ebbs, there is every chance of saving lives. It would be better to help a vessel in with as much canvas as she could bear, and forge her in as far as possible. At Grandison's Harbour, near Ballinacaul village, are two excavated docks, (an inner and an outer,) cut from the rock, with a protecting pier outside, executed at the private cost of the Lord Stuart de Deacon, whom onto the land is.*

"*If a vessel goes in between Helvick and Carrickapane, she must avoid the Clannern, and run for Ballinacourty Point; and if a vessel goes through the Broad Mound, between Carrickapane and the Runners, she must run for Ballinacourty Point also (that is, with leading winds), and when she gets off Ballinacourty Point, at three-quarter flood, before which it is not advisable to proceed, she keeps about half a cable's length from high water mark of that point, and then runs up about midway between that point and the Abbeyside Point (which lies opposite the Cunnigar, on the starboard hand), having a bight of water, or little bay, on the starboard hand; and then she shapes her course for Roderick's Quay, or the old castle on the quay, opposite to Abbeyside Point, which lies right in a line fronting you, between Abbeyside Point and the Cunnigar Point: and when abreast of the Cunnigar, edge away for the anchorage off the quays; and if it be fully occupied, she may beach, on soft mud, opposite the town on the Abbeyside.*

"*The Pool lies just above the upper Ballinacourty Point, and as good anchorage at low water, in 2 fathoms; therefore a vessel may come to an anchor there at any time of tide; and if at anchor there in a heavy gale at S. or S.W., and oblige to slip before the tide rises, she may beach on mud, on the starboard side. The channel opposite the bar is very narrow. Care must be taken not to approach the bridge, above the anchorage, too close, as a very rapid tide shoots through the arch at times. The bight inside the Cunnigar, which dries at low water, is seldom used; but a vessel may lie at the back of Cunnigar, off the church, on soft mud.*

"*In proceeding up the bay with a scant wind, easterly, I would advise keeping close to the Runners Rock, and rounding Ballinacourty Point as near as safe, as thereby she will have an advantage, the channel lying close to that point. At three-quarter flood, or near high water, and beating in care must be taken not to stand too far to the westward, as the western side, from nearly opposite the lower point of Ballinacourty, is shoal, there being so extensive a strand on that side (the port); and though apparently a fine sheet of water, it is deceptive; in fact, in beating in, the land, when standing to the westward, is worth pages of directions.*

"*The tide on full and change days flows till about 5h. 12m.: springs rise 12½ feet, neaps 1½ feet. The tide on the ebb and flood runs sometimes very strong between the Cunnigar and Abbeyside Points. Vessels drawing 12 or 13 feet have water at the quay, and 3 or 4 feet more a mile outside the quay.*

"*Dungarvan is an excellent market for fish. The Maid of Dungarvan, a famous fishing smack, says of Helvick, extends from Muggert's Bay, under Sea-View Head, 10 or 12 miles from E. to W. Dungarvan is a brisk place of business.*

**TRAMORE BAY**—It is 13 miles from Helvick Head, and 4½ miles to the westward of Cork City, in the Dungarvan Bay of Tramore, formed by Great Northern Head on the W. and Dromedary Head on the E. This bay is about 2½ miles wide, and nearly 1 mile deep; the water here being low renders it liable to be mistaken for the entrance of Waterford Harbour, and should therefore be carefully avoided. It has been noted, when the Rock Light-house cannot be seen, that the bay has been several times mistaken for the entrance of Waterford Harbour. Hence, much mischief might be done by a vessel not being in the bay, and the boat side was with great



velocity towards Rhineshark Harbour; which operating jointly, render it almost impossible for a ship so caught in the bay to get out of it by plying to windward: and in case of coming to an anchor, the ground is so foul and rocky that ships have been frequently lost. The N.W. part of the bay is the only place where there is a possibility of escape; the E. side being so shoal and full of rocks that ships unfortunately forced on that side become involved in terrible breakers at a considerable distance from shore. The village of Tramore stands on the W. shore, nearly 2 miles within Great Newtown Head; its white terrace rising from the beach to the steep shore on which it is built. It is high water, full and change, at 5h. 40m.; springs rise 13 feet.

**Beacon Towers.**—Three towers have been erected on Great Newtown Head, the western boundary of Tramore Bay, and two on Brownstown Head, its eastern boundary; by which it may now readily be distinguished from the entrance of Waterford, or any other part of the coast. On the central tower upon Newtown Head is the Herculean figure of a man, with one arm pointing towards the Hook light-house.

**RHINESHARK HARBOUR** is on the eastern side of Tramore Bay, and may be entered by small vessels with a pilot. In the shallowest part of the channel are only 6 to 8 feet at half-tide; but it is narrow, without either perches or buoys; and as the danger of getting aground on the point of sand, which lies at the entrance, is great, no stranger should attempt to go in unless absolute necessity requires. In that case, endeavour to have 4 hours' flood, and keep within a cable's length of the starboard shore, notwithstanding the appearance of breakers on that side, until you are nearly a mile up, where the water is smoother. But if embayed here, when the wind renders it impossible to be extricated, run on shore anywhere near the W. side of the bay, which will afford the best means of safety, rather than attempt the harbour. On the N.E. part of the bay are the Pollock Rocks.

**SWINE HEAD** (on the W. side of the entrance to Waterford) is opposite to Hook Point, distant therefrom 4 miles N.W. by W. To the southward of this head is the Falskirt Rock, which is steep-to, and covers at two-thirds flood.

**WATERFORD HARBOUR** is 5 miles to the eastward of Tramore Bay. From Great Saltee Island to Hook Point, on which Waterford light-house is erected, the bearing and distance are N.W. by W.  $\frac{1}{4}$  W.,  $11\frac{1}{2}$  miles; and from the Longships light-house, off the Land's End, to Waterford light-house, N.  $\frac{1}{2}$  E.,  $43\frac{1}{2}$  leagues. When coming from the southward or the eastward for Waterford, bring Sleaman Mount, (a remarkable mountain, inland) to bear N.E., until you see Hook light-house on the E. side of the entrance of Waterford Harbour.

**Hook Light-house.**—This is an excellent light-house, and to render it a better day-mark the main shaft of the light-house has been marked with three horizontal red belts, each 10 feet in height, and spaced 9 feet apart; and the lantern dome is coloured red, the remainder of the tower white. The light is fixed, elevated 152 feet above high water, and visible 16 miles. In foggy weather a gun will be fired every 10 minutes.

**Duncannon Fort Lights.**—Two lights in Duncannon Fort, one above the other, 10 feet apart, the higher being 53 feet above high water, are exhibited all night, to direct vessels to the bar between the buoys, and visible about 10 miles. The upper light shows also in the direction of Passage, but the low light is seen only from seaward.

An additional light-house is erected N.N.E.  $\frac{3}{4}$  E. from Duncannon Fort light-house, distance  $5\frac{1}{2}$  cables' length. The tower is circular, of a white colour; and exhibits a fixed bright light, 128 feet above high water, visible 16 miles.

These two light-houses kept in a line, or the three lights one over the others, will lead in the best channel across the bar, between the eastern and the middle buoys on the bar.

**Spit Light, OFF PASSAGE POINT.**—This light-house is built on screw piles, and exhibits a red fixed light. By keeping the light open of the port bow, and giving the point a berth of half a cable, leads in the best water to the anchorage at Passage, where a vessel can bring up in safety. To a vessel proceeding up the harbour, this

light will first become visible when about half a mile above Duncannon Fort, when it will be seen bearing N.N.W.  $\frac{1}{2}$  W., distant nearly a mile.

**Buoys.**—About a mile northward of Creden Head is the bar, composed of loose shingle, which stretches across. On this bar are three buoys, the middle buoy is red and lies on a patch of only 9 feet, the eastern buoy is black; the channel lies between them; the buoy on the edge of the bank to the westward is also red. In northerly winds there are only 13 feet on it; but southerly winds keep the water up; ordinary springs rise 13 or 14 feet, neaps 9 or 10 feet. The deepest water is towards the starboard shore. Between the bar and Duncannon Fort are from  $2\frac{1}{2}$  to 7 fathoms; deepest nearly abreast of the lights.

**Directions.**—Having passed the Hook Point, to which you should go no nearer than about 3 cables' length, to avoid falling into irregular streams of the tide that run near it, and intending to proceed for the anchorage at Passage, take flood-tide, or a leading wind, and steer N.N.E.  $\frac{3}{4}$  E. towards Creden Head, and when abreast of it, distant 4 cables, continue N.N.E.  $\frac{3}{4}$  E. for Duncannon Fort, carefully avoiding the sand-banks which extend from both shores. A shoal, which nearly dries, commences at Broomhill Point on the E. side, called Ballistraw Flat, and joins the Duncannon Strand below the fort, on the Spit of which a black buoy is placed. The shoal flats on the W. side commence at Creden Head and continue up to Passage, running off shallow nearly a mile from the shore, narrowing the navigable channel very much, as you draw up towards Duncannon Fort, where the spit of Drumore Bank, on which is a red buoy, reaches within a quarter of a mile of the Fort. On this part of the bank are three red buoys. The thwart-mark in the narrowest part of the channel is, Father Hogan's house on with Newton trees.

When above the lights, keep near the eastern side, steering about N. by W. for the church of Ballyhack, leaving three red buoys on the Drumore Bank on your port hand, until the perch, which is fixed on the upper end of the Drumore Bank comes on with the town of Passage; you may then steer upward, N.W. by N., in mid-channel. Abreast of this perch are 10 and 11 fathoms. The usual anchorage is about half a mile above Passage town, in 5 or 6 fathoms; in passing Passage keep the western shore aboard, to avoid the Seedes Bank, on which are only 7 to 10 feet at low water; it stretches nearly half river over, at half a mile below Buttermilk Point, and on its western edge two buoys are placed, in 14 feet.

At 2 or 3 miles above Passage is very good anchorage, and there the stream is much weaker than at Passage. In proceeding at about low water, keep towards the western shore; if the flood-tide be running, keep in the rough part of the stream, and you will go clear of the shoals on the eastern side. Cheek Point Bar stretches across the river in a northerly direction to Drumdowney Point, the western point of entrance to Barrow River, which runs to the northward, 8 miles, to New Ross, where the tides rise 13 feet at springs. Cheek Point Bar is only  $1\frac{1}{2}$  cable's length across, with 8 feet on it at low water, but as soon as you cross it, there are 6 or 7 fathoms; once over this bar you may safely proceed up to Waterford, as spring-tides rise 13 feet; at such a time a vessel drawing 20 feet may go up to the town, where there are 4 or 5 fathoms near the quays. At Waterford Bridge it flows full and change at 6h. 6m., and at Duncannon Fort, 5h. 20m.

**RIVER SUIR, Lights.**—A light is shown at the eastern end of the King's and Queen's Channels; in passing the light entering the King's Channel it will show red, and on entering the Queen's Channel it will show green.

**DUNMORE HARBOUR.**—On the S.W. side of Dunmore, or Whitehouse Bay, at the distance of  $2\frac{1}{2}$  miles W.S.W. from Creden Head, a pier or sea-wall has been built, extending from the point a considerable distance eastward, thereby forming a harbour.

**Light.**—At the end of the pier, which is on the S. side of the harbour, stands a light-house. The lantern exhibits two faces; the one seen to seaward, of a red colour, and will be visible some time before you pass the Hook light-house; the other when seen from within the harbour, is clear and bright, but not visible up the harbour beyond Creden Head. This building is white, and the lantern 44 feet above high water, and the light visible about 5 miles. It is high water, full and change, 10<sup>h</sup>. 07<sup>m</sup>. Springs-tides rise  $12\frac{1}{2}$  feet, neaps 9 $\frac{1}{2}$ .

Dunmore Harbour in its present state can afford but small accommodation, there being but 7 feet at low water spring-tides, within the piers; but is useful as a fishery harbour to vessels engaged in the trawling trade. The bay affords temporary anchorage with northerly winds, in  $3\frac{1}{2}$  fathoms water, on a muddy bottom, with the light-house bearing S.W. by S., 1 to 2 cables distant, and about a cable off shore.

In SLADE BAY,  $1\frac{1}{2}$  mile to the N.E. of Hook light-house, vessels may anchor and be sheltered from easterly and northerly winds. The ground is foul on the N.E. part of this bay. The mark for the best anchorage is, the pier-head and the castle in one, opposite to a stone wall, which runs up a little way from the shore, in 5 fathoms, clean and sandy ground. Slade Harbour, about a mile to the eastward of the Hook light-house, is dry at low water, and only fit for small vessels. Between the pier-heads are 11 feet at high water, spring-tides, and 8 or 9 feet at neaps.

FETHARD.—On the N. side of Ingard Point, and about 10 miles N.N.W.  $\frac{1}{2}$  W. of Saltee Island, is a small dry harbour; between the pier-heads are 8 or 9 feet at high water spring-tides, and 6 or 7 feet with neap-tides. From the point a rocky ledge extends eastward about 2 cables' length. To avoid it on the N. side, when going in or out, keep an old castle, standing at the S. end of Fethard trees, on with the pier-head.

At half a mile eastward from the entrance of Fethard Creek (which is to the northward of Ingard Point) is a long rocky shoal of only 4 feet. From Ingard Point a ledge extends nearly half-way to this shoal; and a shoal, of 5 feet, called the Bridge of Brecaun, extends about half a mile S.  $\frac{1}{2}$  E. from the point next to the northward of Slade Harbour, and W. by S.  $\frac{1}{2}$  S., 3 miles from Baginbun Point. To avoid this shoal, keep any part of the Mountain of Forth, near Wexford, open of or without Baginbun Head.

Bannow Bay.—N.W.  $\frac{1}{2}$  N., about  $8\frac{1}{2}$  miles from the S.W. point of the Great Saltee Island, is Baginbun Head, the western boundary of Bannow Bay; and to the northward of it is Ingard Point. On Baginbun Head is a conspicuous martello tower. At  $3\frac{1}{2}$  miles E. of Baginbun Head lie the Keeragh or Bannow Islands, these are two small islands, with some rocks about them, which are nearly a mile distant from the main. E.N.E. from these, distant  $1\frac{1}{2}$  mile, is Barmouth, a small narrow opening, of no use to shipping. The space from Barmouth to Ballyteige Castle Point is called Ballyteige Bay. Here, from half-flood to half-ebb on the shore, the stream runs eastward; and from half-ebb to half-flood, the contrary. From the Saltees light-vessel to the Tuskar, the stream sets along the land, but the flood begins to tend to the northward off Carnsore Point, and sets sharply round it into the Irish Channel, which should be carefully guarded against.

The Saltee Isles.—The S.W. point of Great Saltee Island lies about S.E. by E.  $\frac{1}{2}$  E., 4 leagues from the Hook Point. Off the N.W. point of this island you may anchor in 5 or 6 fathoms. Little or North Saltee Island lies about  $1\frac{1}{2}$  mile S. by W.  $\frac{1}{2}$  W. from Crossfarnoge Point, and 1 mile N.E. of which stands Ballyteige Castle. The Little Saltee is joined to the main by a ridge of stones with from 6 to 9 feet over it, called St. Patrick's Causeway, or Patrick's Bridge. On the south point of Little Saltee Island is a beacon.

On the E. side of Crossfarnoge Point is the town and pier-harbour of Kilmore, where small vessels may find good shelter by entering near high water. Kilmore Spit runs off from the E. side of the harbour nearly a mile towards St. Patrick's Causeway. At the Great Saltee the tide flows, full and change, at 5h. 8m., and rises 13 feet.

CONINGMORE ROCK, which is 11 feet above high water, lies  $1\frac{1}{2}$  mile S.S.W. from the S. point of Great Saltee Island. At  $1\frac{1}{2}$  mile W. by N.  $\frac{1}{2}$  N. from Coningmore, lies a patch of  $4\frac{1}{2}$  fathoms, called the Red Bank, to clear which to the northward, bring the west edge of Little Saltee opening north of Great Saltee, E.N.E.  $\frac{1}{2}$  E.

CONINGBEG ROCK, which appears at one-third ebb, lies about a mile S.W. by W.  $\frac{1}{2}$  W. from Coningmore Rock, and from the S. point of Great Saltee S.W.  $\frac{1}{2}$  S.,  $2\frac{1}{2}$  miles. When Coningmore Rock is on with the W. end of the Great Saltee, N.N.E.  $\frac{1}{2}$  E. you are to the eastward of Coningbeg Rock; when Ballyteige Castle and W. edge of

Saltee are in one N.E. you are to the westward of it, and which is the leading mark between it and the Red Bank. The Coningbeg is the most outlying danger in the vicinity of the Saltees, and is  $6\frac{1}{2}$  miles S.W. of Kilmore, the nearest part of the coast. It is composed of coarse granite, and uncovers at 2h. 8m. after high water by the shore; and at low springs exposes a surface of 30 feet by 90 in extent; there are 25 fathoms close to it. Tory Hill open S. of Baginbun Tower, N. by W.  $\frac{1}{2}$  W., clears Coningbeg and the Red Bank. Some years ago attempts were made to build a light-house on the Coningbeg Rock, and there still remains some shafts of the iron pillars, which form a conspicuous beacon, denoting that part of the rock where the light-house was intended to be built.

The BRANDIES ROCKS, which cover at one-third flood, lie S.E., distant  $1\frac{1}{2}$  mile from the S. point of the Great Saltee. To go clear of them on the E. side, get Slieve Coiltia (a mountain to the N.-eastward of Waterford), opening N. of Little Saltee N. by W.  $\frac{1}{2}$  W.; to go clear of them on the S. side, keep Coningmore Rock N.W. by W.  $\frac{1}{2}$  W.; and on the W. side, Slieve Coiltia opening S. of Great Saltee N. by W. leads between Coningmore and the Brandies; or Forth Mountain and W. point of Little Saltee N.E. by N., will also lead between. The Whitty Rock, above water, lies a quarter of a mile N.W. of the Great Saltee; and half a mile E. by N. from the Whitty is a rock under water, with 3 to 4 fathoms round it.

About  $1\frac{1}{2}$  mile S.-eastward of Little Saltee are two knolls, with  $2\frac{1}{2}$  to 4 fathoms. The northernmost, of  $2\frac{1}{2}$  fathoms is named Long Bohur; a little farther southward is Short Bohur, with 4 fathoms on it; and nearly a mile to the southward of the latter is the Bore, with 3 fathoms on it. To clear the Bore to the westward, bring Slieve Coiltia and S.W. point of Little Saltee, N. by W.  $\frac{1}{2}$  W., and to clear the Long Bohur to the northward, bring the Makestone (a conspicuous rock on the N.E. of Great Saltee) in one with the S. point of Great Saltee, W.  $\frac{1}{2}$  S.

The JACKEN ROCK lies three-quarters of a mile N.W.  $\frac{1}{2}$  N. from the S. point of Little Saltee. To clear Jackeen on the S. side, keep the beacon on Little Saltee on with the W. point of the island, bearing S.E.  $\frac{1}{2}$  E. About half a mile E. by N. from Jackeen is another small rock, with  $3\frac{1}{2}$  fathoms close to it.

There is also a rock about a cable's length from the beacon on the S. point of Little Saltee, and another rock, with 3 feet on it, on the west side of the island, about half a mile northward of the beacon.

The FORBORN ROCK lies half a mile from Crossfarnoge Point, with Ballyteige Castle bearing N.E. by E., and a quarter of a mile further eastward is another small rock. The mark to clear all the rocks lying westward of the Saltee, is to keep Ballyteige Castle in one with the W. rocks off Crossfarnoge Point, bearing N.E. by E.  $\frac{1}{2}$  E.

In order to avoid the shoals in going between the Saltee Islands keep nearer to the Little Saltee than to the great one.

Saltee Light-Vessel, with the word "Coningbeg" painted on her sides, is stationed off the Coningbeg Rock in 32 fathoms, and bears from the Great Saltee Island S.W., distant  $4\frac{1}{2}$  miles, and W.  $\frac{1}{2}$  S.  $19\frac{1}{2}$  miles from the Tuskar Rock. This vessel formerly showed two fixed white lights, but it is intended in the summer of 1878 to alter them to one flashing white light, showing three flashes in quick succession every minute: the time occupied by the three flashes being about 23 seconds, the flashes being followed by an eclipse of about 37 seconds. A powerful fog siren is also established at the light-vessel.

BLACK ROCK.—E.  $\frac{1}{2}$  S. 8 miles from the S. end of Great Saltee, and W.  $\frac{1}{2}$  S. 2 miles from Carnsore Point, lies the Black Rock, always above water. Between the Black Rock and the shore, to the westward of Carnsore Point, is an anchorage in 6 or 7 fathoms. On the N. side of the Black Rock, lies a small rock called the Tercheen.

The BARRELS.—Nearly a mile S.E.  $\frac{1}{2}$  E. from the Black Rock are two small rocks, called the Barrels, which appear at half-ebb and about half a mile N. from the Barrels is the Nether Shoal of  $2\frac{1}{2}$  fathoms. To go to the southward and eastward of them, when sailing to the westward, keep Greenore Point open of Carnsore Point until Black Rock bears N.  $\frac{1}{2}$  W., or is on with Bally Castle; you may then

steer W. by S. past the rocks which lie to the southward of Great Saltee Island, or to the southward of the Saltee light-vessel. Going to the eastward, keep above a mile to the southward of the Black Rock, and bring the Tuskar light to bear northward of E.

**Buoy.**—A conical black buoy, with "Barrels Rocks" painted thereon, has been placed to mark this danger. This buoy lies in 15 fathoms,  $1\frac{1}{2}$  cable's length S.  $\frac{1}{4}$  E. from the rock, with Nethertown house in one with the coastguard station on Carnsore Point; Black Rock in one with Castle ruins; Tuskar light-house E.  $\frac{1}{4}$  N., distant  $7\frac{1}{2}$  miles, and the beacon on Little Saltee Island W. by N.  $\frac{1}{4}$  N.,  $7\frac{1}{2}$  miles.

**CARNSORE POINT** is the S.E. point or extremity of Ireland, in latitude  $52^{\circ} 10' 20''$ , and longitude  $6^{\circ} 21' 45''$ , and bears from Cape Cornwall N. by E., distant 127 miles; from the Smalls light N. by W.  $\frac{3}{4}$  W., 37 miles; and from St. David's Head N.W. northerly, distant 42 miles. High water, full and change, off Carnsore Point at 6 hours; spring-tides rise 9 feet.

**TUSKAR.**—About E.  $\frac{1}{4}$  S. from Carnsore Point, distant 6 miles, lies the Tuskar, a very remarkable rock, resembling a vessel bottom upwards, 15 feet above the level of the sea at high water, upon which is a light-house. The rock bears from the Longships light-house nearly N. by E.  $\frac{1}{4}$  E., distant 129 miles; and from the Smalls light-house, N. by W., distant 35 miles. About two-thirds of a mile S.W. of the Tuskar, there are some sunken rocks of 9 feet called the South Rock; a red beacon buoy is placed in 25 fathoms south of this rock,  $1\frac{1}{2}$  mile S.W. by S. from Tuskar light-house.

**Light.**—The light-house on the Tuskar Rock is a circular tower, white, 110 feet high and 101 feet above high water. It exhibits a revolving light every minute, two faces white and one red. The white light is visible 15 miles and the red light about 9 miles. During foggy weather a bell is tolled every half minute.

**BAILLIES.**—Nearly midway between the Tuskar and the main is a long narrow sand called the Baillies, the S. end of which, in 7 fathoms, bears W. from that rock, and E.S.E. from Carnsore Point; it thence extends N.N.E., 3 miles, with  $5\frac{1}{2}$  to 8 fathoms on it. To avoid the Baillies on the E. side, keep nearer to the Tuskar than the main. Near the sand in this channel are 16 fathoms. In the bay, opposite to this sand, about a mile from the shore, you may anchor in 6 or 7 fathoms.

The **FUNDAL ROCK** lies E. by N., a mile from Carnsore Point, and about half a mile from the shore, with no safe passage between. It is uncovered at half-tide, is steep-to, and marked by a perch. The Coullough Rock of 3 feet water lies three-quarters of a mile E.N.E. from the Fundale, having 4 fathoms just within it; this part of the coast is bordered with rocks. The mark to clear these rocks from the eastward is Black Rock and Carnsore Point in one, bearing W.  $\frac{1}{4}$  S.

**TIDES.**—The tides flow on the full and change days of the moon, in the following harbours, nearly as follows:—At Bear Haven, 4h. 14m.; Crook Haven and Long Island Sound, 4h. 9m.; Baltimore Harbour, 4h. 23m.; Kinsale, 4h. 43m.; at Cork, 4h. 58m.; Youghal, 5h. 14m.; and Dunmore Harbour, Waterford, 5h. 20m. Spring-tides rise at Crook Haven and Long Island Sound, 11 feet, neap-tides 8 feet; at Baltimore spring-tides rise  $10\frac{1}{2}$  feet, neap-tides 8 feet; at Kinsale spring-tides rise  $11\frac{1}{2}$  feet, neap-tides 9 feet; at Queenstown mean spring-tides rise 12 feet 8 inches, neap-tides 10 feet; at Youghal Harbour spring-tides rise  $12\frac{3}{4}$  feet, neap-tides 10 feet; and at Dunmore Harbour, Waterford, spring-tides rise 13 feet, neap-tides  $9\frac{3}{4}$  feet, though much depends on the direction of the wind. Southerly winds cause the tides to rise 1 to 2 feet higher, and northerly winds will equally depress them.

## N.W. COAST OF FRANCE.

THE ISLAND of USHANT being sometimes made by homeward bound ships reaching across the Bay of Biscay, we append here a short description of that island, together with the light-houses erected thereon:—The island is steep and craggy, being 4 miles in length from E. to W., and 2 miles broad. On the S.W. side of [E. CHANNEL.]

there is a harbour, but it is only known to the French. The rest of the island is surrounded by rocks, except at an anchorage on the N. side.

**Lights.**—On the N.E. part of the island is a conspicuous light-house exhibiting a powerful fixed light, elevated 272 feet above high water, and may be seen, in clear weather, 20 miles off. This is the old light-house; and in 1863 an additional light-house was erected on the N.W. extremity of the island, called Point de Creac'h. This light-house is situated in latitude  $48^{\circ} 27' 34''$ , and longitude  $5^{\circ} 7' 52''$ , is a circular stone tower 154 feet in height, and elevated 223 feet above high water. It exhibits a revolving light every 20 seconds, and is visible about 24 miles. The eclipses are succeeded by one red and two white faces, each lasting 20 seconds. N.W. by W.,  $3\frac{1}{2}$  miles from the old light-house, and N.E. by N., 2 miles from the western part of the island, lies a dangerous bed of sunken rocks, called the Basse Callet, and at the distance of  $1\frac{1}{2}$  mile from the S.W. point, a rock named the Jument, equally dangerous, being alternately covered and uncovered at every tide; and three-quarters of a mile from the W. point lies the Lourvas, which dries  $4\frac{1}{2}$  feet at low water.

These are all the dangers that we think requisite to notice in this part of the channel navigation; the two conspicuous lights of Ushant being the principal objects for the English navigator homeward-bound. Full directions for the NORTH COAST OF FRANCE are given with the LARGE SCALE CHARTS, in four parts, extending from Dunkirk and Calais, to Ushant and Brest, &c.—*See Catalogue.*

## GENERAL DIRECTIONS FOR SAILING INTO AND UP THE ENGLISH CHANNEL, FROM THE ATLANTIC OCEAN.

**WINDS.**—Although the winds at the entrance of the English Channel are various, and subject to uncertain directions, at all times of the year, yet there is a general, and somewhat uniform course of them to be expected, which will most commonly be found to prevail at certain periods of the year; thus from January to May, they are observed to come from the N. and N.E., although sometimes in January, they may incline to the S. and S.-westward; and from January to May, S.-westers will occasionally occur; yet it will seldom be found to blow long from that quarter, but shifts round to the westward, and sometimes to the N. and N.E.; but from May to December, westerly and S.-westerly winds may be said most commonly to prevail.

**CURRENTS, &c.**—A current of considerable strength sometimes sets across the entrance of the English Channel, at some distance from, and to the westward of, Ushant and Scilly, in a N.W. and W.N.W. direction, and extending occasionally beyond the S.W. angle of Ireland, the breadth and velocity of which is greatly dependent upon the wind most prevalent, and proportioned to its strength and direction; this is not frequent, but sufficiently so to call for caution; winds blowing from the W. and S.W. will be found very much to accelerate its force, and render it an object of attention, to prevent the possibility of being swept to the northward of Scilly.

A strong S.W. wind constantly throws a great accumulation of water into the English Channel, which tends greatly to increase the force of the flood-tide, while it considerably retards the ebb, and augments the rise of the water full 10 feet above its ordinary elevation; therefore, vessels having entered the Channel with a strong S.W. gale are liable to be driven ahead of their reckoning, and by taking the first of the flood, will have 10 or 11 hours tide, which, at 8 or 10 knots, will carry them from off the Start to Beachy Head, or even so far as Dungeness.

The following remarks on the tides and on entering the Channel are from Captain *White's Directions for the English Channel.*

**TIDES on Approaching the English and Irish Channels.**—"In making

allowances, however, for the different sets and velocity of the tide, as affecting the place of a ship, much consideration is due to the force, direction, and duration of the wind; strong breezes from between the S. and W.N.W. elevate the level of the flood-tide, as well as increase the rapidity and duration of the stream to a great degree; and the succeeding ebb is neutralised, though not proportionally, by their effects, while the winds from between the N. and E.S.E. have been observed to produce directly the reverse.

"When the level of the flood-tide is raised more than ordinary by the moon's approach to the earth, the succeeding ebb is proportionally low, the level of the half-ebb and flood varying about half a foot on each side the mean height. But when a similar elevation takes place from the pressure of the wind alone, the following ebb is never so low as it would have been, had the flood not been so impelled beyond its ordinary limits, and, consequently, the half-ebb level is above the true one, or that which would have been produced by the action of the sun and moon.

"Along the coasts of England, France, and Ireland, the course of the stream, during the spring-tide, remains quiescent, or nearly slack, for half an hour on each side of high and low water; and during an ordinary neap-tide, this is prolonged for nearly an hour; but the water in the latter case also sooner reaches its meridian. In the offing, however, as before observed, there exists no inactivity, the stream preserving its constant revolving motion; and the general ratio between the stream along shore and that in the offing, appears to be from three-quarters to three-eighths of the mean rate.

"A series of westerly gales in the Atlantic Ocean universally creates a considerable accumulation of water in all ports and harbours throughout the English and Irish Channels and Bay of Biscay, beyond that which is occasioned by the mere ingress of the natural tide; and it therefore follows, that the offing also must be equally subject to a similar effect; however, it may be weakened by a diffusion into space. Yet, in this particular, the direction of the wind is of more consequence than its actual force. If the wind is from the southward, the flood will be augmented in the Irish channel; and if from the northward, in the Bay. Westerly winds will probably produce equal accumulation in each.

**Striking Soundings.**—"During the winter season, when the almost total absence of the sun and stars preclude the possibility of ascertaining a correct parallel by astronomical means, the approaches to Scilly or Ushant should always be contemplated with caution; because, in that case, the course steered, distance measured, depth of water, and quality of ground, are the only elements that can be resorted to. In these circumstances, sounding is or ought to be, of the very first consideration. Many vessels, by neglecting this precaution, have been actually found within Scilly, unconscious of their situation; and numerous indeed are the instances of those who have ended their voyages and their lives among Les Minquiers Rocks, or on the iron-bound coast of France, by not sounding at all; while others have been 3 degrees or more out of their reckoning, even when eastward of the meridian of Cape Clear; which never could have been the case, had common-place attention been given to the lead progressively.

"When running for the English Channel, the ground should be invariably sought for in good time, nor should the use of the lead in any case be neglected, after the ground has once been obtained, especially during the night; because in the parallel of  $51^{\circ} 10'$  the same soundings will be found at 10, 18, 28, and 43 leagues from Scilly; nor is this identity confined to that latitude alone. By the above precaution, all the various alterations in depth, substance, and colour, will be progressively unfolded while advancing to the eastward, and the parallel of latitude with greater facility preserved, or regained, if temporarily departed from.

"Neither should too much reliance be placed upon a single compass; and the various local anomalies which are found, more or less, in every vessel, render this consideration of almost as much importance as the former. Not allowing for the effects of local attraction may alone cause an error of 14 miles in the latitude, during a run from Little Sole Bank to Ushant (one-seventh of the whole breadth of the Channel), and this error will be to the southward of the real position, and,

of course, in the most dangerous direction, with reference to that parallel. In this emergency the moon, the bright planets and stars, and especially the polar star, offer a ready and certain co-operation, as the latitude can thence be obtained, at all hours of the night, when the horizon is clear, with nearly as much certainty as that deduced from the meridional altitude of the sun.

"Generally speaking, the water in the entrance of the English Channel is from 8 to 10 fathoms deeper towards the French coast than towards the English. The soundings, too, are coarser (the stones are larger), the different substances altogether more loose and unconnected, and the compound of a paler colour than on the northern side of the Channel."

In entering the Channel from the N.W. or W., ships should always endeavour to obtain soundings as early as possible, getting between the latitudes of  $49^{\circ} 15'$  and  $49^{\circ} 25'$ , according to the inclination of the wind, "because," says Captain White, "it is between these limits that your relative situation can with greater certainty be ascertained as well in respect to depth of water as to quality of ground, or the distinction between oaze and sand, and which cannot be so well defined in any other latitude on making an approach to the Channel." Within these parallels they will first strike soundings on the edge of the bank, in about the longitude of  $11^{\circ} 15'$ , and at 65 leagues from Scilly, when their depth will be from 270 to 335 fathoms, on a bottom of dark ground, oaze mixed with sand; and when they get from 90 to 86 fathoms, on muddy bottom, they will be 5 or 6 leagues within the edge of the bank, and about 57 leagues to the westward of the meridian of Scilly. At 6 leagues further eastward, in the parallel of  $49^{\circ} 25'$  are 69 fathoms, sand, with specks, on the outer edge of the Greater Sole Bank, and 3 leagues further there are 70 fathoms on its inner edge, whence the depth suddenly increases to 90 fathoms, mud. At 10 leagues further eastward, in the same parallel,  $49^{\circ} 25'$  are 81 fathoms, mud; and a league further, 76 fathoms, fine white sand; this is 40 leagues W. by N. from St. Agnes light, in Scilly Islands. Proceeding eastward, at the distance of 3 leagues further, they will find 80 fathoms, sand; and at the end of another 3 leagues, 83 fathoms mud; the bottom from thence, on the same parallel, continues muddy 9 leagues further eastward; a league beyond which are 78 fathoms, sand: this is in longitude  $8^{\circ} 2'$ , and 24 leagues, W.  $\frac{1}{4}$  N., from Scilly. At 5 miles further eastward, they will be on the E. edge of the Haddock Bank, where there are 60 fathoms, sand: having crossed which, it deepens to 75 and 70 fathoms, mud; and at the distance of 6 leagues further, there are 69 fathoms, sand. In longitude  $7^{\circ}$ , upon the same parallel, there are 66 fathoms, sand; continuing hence, in the same direction, to the distance of 9 leagues eastward, there will be found 61, 64, 63, 61, and 63 fathoms, all brown and speckled sand; the latter depth is on the meridian of Scilly; continuing eastward, 15 leagues further, there are 63, 62, 64, 61, 59, 58, and 55, fathoms, all sand; the latter depth being about the meridian of the Lizard.

**Soundings in Latitude  $50^{\circ}$ , or in the Stream of Scilly.**—To the northward, or in the stream of Scilly, in the latitude of  $50^{\circ} 0'$ , or between it and  $50^{\circ} 10'$ , there are 101 fathoms, on muddy bottom, in longitude  $10^{\circ} 53'$ ; this is 59 leagues to the westward of Scilly; but if to the southward in latitude  $49^{\circ} 55'$  you will have no bottom at 190 fathoms, in longitude  $10^{\circ} 53'$ , but 4 leagues further eastward there are 84 fathoms, sand; continuing on, in the parallel of  $50^{\circ} 0'$  and at 4 leagues further, 72 and 73 fathoms; 3 leagues beyond which are 78 fathoms, all sand. In longitude  $9^{\circ} 50'$ , which is 3 leagues further eastward, there are 77 fathoms, mud; from hence, the bottom is invariably muddy to the distance of  $4\frac{1}{2}$  leagues from Scilly. The depths are 72, 75, 74, and 61 fathoms, in longitude  $8^{\circ} 39'$ : 4 leagues further eastward there are only 55 fathoms; and 4 or 5 miles further, 69 or 70 fathoms close to its E. end; then 64, 75, 65, and 60 fathoms; the latter depth on the Jones' Bank in latitude  $50^{\circ} 5'$ , longitude  $7^{\circ} 43'$ , distant 18 leagues to the N.-westward of Scilly. From this bank 62, 65, and 64 fathoms will be found 9 leagues further eastward: the depth from thence decreases from 61 to 58 fathoms, so far as the muddy ground extends; and thence to 53, 57, and 50 fathoms, on coarse gravel and sand, which is within 4 miles of the Scilly Rocks.



The Soundings round Scilly, to the distance of  $4\frac{1}{2}$  leagues westward, and 10 leagues to the southward and northward, are all coarse gravel, shingles, rotten rocky substances, or sand; no mud is to be met with in all that space. At 10 leagues S.-westward from St. Agnes light-house there are 68 fathoms; at half that distance, in the same direction, 55; and within 5 miles of the rocks, 54 fathoms. At 10 leagues to the southward of the light-house there are 58 or 60 fathoms, on a spot called the Admiralty Patch, round which in all directions are 63, 64, and 65, fathoms, mixed soundings, and rather coarse sand; at 5 leagues, 55 and 60; at 4 leagues, 51 and 52; and at 4 miles distance, in the same direction, 45 fathoms, fine sand. There are 50 fathoms at 5 leagues' distance, S.E. from the light-house, and 45 fathoms at 4 miles distance. At 6 leagues N.W. from the light-house, there are 57 fathoms, and at 3 miles from the rocks, in the same direction, 44 fathoms. At 5 leagues N. from the light-house, there are 47 fathoms; and at 10 leagues, 52 fathoms. N.E. from the light-house, distant 5 leagues, are 48 fathoms; and 2 miles from St. Martin's Head, 42 fathoms. There are 42 fathoms within 2 miles of the rocks to the eastward.

Jones' Bank lies between the parallels  $49^{\circ} 57'$  and  $50^{\circ} 11'$ , and longitude  $7^{\circ} 37'$  and  $7^{\circ} 53'$ . It has from 51 to 59 fathoms sand, upon it, and from 62 to 70 fathoms near it. The shoalest part of this bank is in latitude  $50^{\circ} 3'$ , and longitude  $7^{\circ} 50'$ . It is consequently 17 leagues from Scilly; and from Cape Clear, it bears S. by E., distant 36 leagues. The tide causes universally great ripples on all parts of this bank, particularly between 4 hours' ebb and high water. There is no bank between it and the Scilly Islands, and is about 14 miles long, and from 4 to 8 in breadth. The soundings on the N. end are coarse sand, and near the middle green oaze; at the S. end oaze and shells; but the ground around it is wholly oaze.

Soundings in Latitude  $49^{\circ}$ .—A little to the northward of this parallel, and in longitude  $11^{\circ}$ , there are 208 fathoms, mud; in  $10^{\circ} 53'$  there are 162 fathoms, mud; 5 miles further E., are 93 and 85 fathoms, both mud; and in longitude  $10^{\circ} 42'$ , begins the southern tract of sandy ground which continues uninterrupted by mud or oaze all the way to the coast of France, on the parallel  $49^{\circ}$ , and longitude  $10^{\circ} 12'$ , there are 90 fathoms; at 10 leagues further eastward, 85 fathoms; 6 leagues beyond it, in longitude  $9^{\circ}$  there are 90 fathoms; then 86, 90, 87, 74, 75, and 73 fathoms; this latter depth is in longitude  $6^{\circ} 56'$ . Continuing eastward, there will be found 73, 70, 75, 73, 71, 66, 69, 67, 59, and 60 fathoms, in a space of 22 leagues, or to the meridian of Ushant, the lead bringing up a pale whitish ground, resembling hard marl, with a mealy surface.

Soundings in and near the Latitude of Ushant.—In latitude  $48^{\circ} 24'$  and longitude  $9^{\circ} 30'$ , and 59 leagues to the westward of Ushant, lies the western part of the Little Sole Banks, which thence extend, in detached patches N.-eastward, and eastward, 13 leagues. On this western part are 84 fathoms on a sandy bottom; and at 3 leagues further westward, no bottom at 200 fathoms. These banks consist of several knolls, with from 65 to 89 fathoms upon them, and from 90 to 100 fathoms between them. Near the S. part, in latitude  $48^{\circ} 15'$  and longitude  $9^{\circ} 7'$  there are 160 fathoms, sand. In latitude  $48^{\circ} 23'$  and longitude  $8^{\circ} 34'$  there are 100 fathoms; 10 or 11 leagues further eastward, 92 fathoms, sand; then 87, 85, 86, and 94 fathoms, all sand; the latter depth is in longitude  $7^{\circ} 34'$ . From hence, for a space of 24 leagues eastward, the depths are 87, 85, 86, 78, 72, 71, 68, and 66 fathoms, all sandy bottom; the latter depth being  $8\frac{1}{2}$  leagues to the westward of Ushant. In the parallel of Ushant, at 23 leagues from it, there are 85 fathoms, white sand; at 18 leagues, 75 fathoms; at 16 leagues are 70, 71, and 72 fathoms, with a coarse pale yellow bottom, having a mealy surface, interspersed with pieces of broken shells, and a substance like chaff. At the distance of 9 leagues, on the same parallel, there are from 63 to 66 fathoms, similar ground, and 65 fathoms within 3 leagues of the rocks. As you approach Ushant, the sand becomes mixed with shells and bits of shells.

In dark thick weather, come no nearer to Ushant, or to the Saintes, than 70 fathoms, and keep the lead going. In these parts different soundings will be met with, but mostly interspersed with small shells, resembling, and called *Bake's Teeth*.

Should a vessel make the New light, erected on Crea'h Point, the N.W. extreme of Ushant Island, it will easily be distinguished from the other lights at the entrance of the Channel. It is a revolving light, showing successively two white lights and one red light, at intervals of 20 seconds; is elevated 233 feet, and is visible in clear weather, 24 miles.

**Best line of approach to the Channel.**—Captain White observes—"From a due consideration of the foregoing materials, it will, I think, be manifest, that vessels bound into the English Channel from the S.-westward, should run well to the northward, when east of the meridian of  $10^{\circ}$ , until oaze forms part of the soundings; and that all vessels bound thence from the N.-westward should, for the same reason, borrow well to the southward, when eastward of that meridian, until the soundings are free from oaze; thus infallibly insuring a safe parallel, in the first instance, whereon to run eastward; and as, during the prevalence of strong southerly and westerly winds, the tides are warped more astream than usual, and found to run considerably longer, as well as with greater velocity, between the N. and W., than at other periods, I am induced to recommend that when running from the edge of the soundings towards the English Channel, upon the parallels of Ushant, Jersey, Trevoze Head, or Cape Clear, during spring-tides, and with the wind blowing strong from between S. and W., the compass-course should be taken at S.E. by E. (instead of, as usual, S.E. by E.  $\frac{1}{2}$  E.) or half a point more to the southward than usual, having in view the preservation of any particular parallel, and this, too, notwithstanding the southing created by local attraction, which, in this case, will amount to one-fifth of a mile in every 5 miles of distance."

When strong westerly gales continue, an easterly current is frequently forced up the English Channel; but with steady easterly winds, the current has often been found to set out to the westward; more particularly, when the Bay of Biscay is open, a S.-westerly current is liable to be experienced.

Having entered the Channel, it is not considered safe to keep over towards the French shore, for the whole length of that coast is full of sunken rocks and dangers, so that the mariner ought never to approach it nearer than just to discover the land from the mast-head. And it is to be observed, that along this shore, and among the rocks and islands, the flood-tide, at the distance of 10 or 12 leagues off the land, sets to the S.E., while the ebb does not set N.W., but W., along shore; so that vessels, driven on the coast with N.-westerly gales, will not have tide to help them off, and are most liable to be driven on shore. "Strangers," says Mr. Dechamps, "looking upon the chart, will observe many inlets that appear like harbours, sufficiently capacious to admit ships in case of distress or stormy weather; but this is an error, for there is no safe harbour, easy of access, on the whole coast of Brittany and Normandy, excepting Guernsey and Jersey, where vessels can take refuge in safety before they reach Cherbourg; while the opposite coasts of England afford safe and commodious ports and roadsteads throughout." The mariner will easily know when he is to the southward, by the coarseness of the ground, frequently meeting with large quantities of sea-weeds, and the over-whelming of the tide, which whirls round in some places with breakers. Therefore he should endeavour to keep upon the English coast, at from 5 to 7 leagues distance, till he gets as high up as Portland.

Having passed Scilly, continue running eastward, for 10 or 11 leagues, coming no nearer the English shore than 53 or 54 fathoms, or further to the southward than 60. After running this distance, the Lizard will bear N.E. or N.E. by N., about 8 leagues, and you will have from 53 to 55 or 56 fathoms, with white broken shells, speckled and yellow stones.

**Making the Land.**—Ships coming into the Channel ought always, if possible, to make the land about the Lizard; for should they afterwards have thick weather, they will know how to steer, or how they advance up the Channel. Some, by neglecting this precaution have, contrary to their expectation, found themselves on the S. side of the channel. This error is greatly owing to the strong indraught between the islands of Guernsey and Jersey, and the coast of Brittany, or *Finis-terre*, which ought always to be guarded against, especially in thick weather. It

frequently happens that ships coming into the Channel have not had an observation for some days back; then a close attention to the peculiar character of the soundings, together with the remarkable rippings and overfalls which so universally prevail, even in the finest weather, off the French shore, will always demonstrate your position, as to whether you are to the northward or southward of the Channel fairway.

When coming from the southward into the English Channel in thick weather and light winds, ships frequently get much to the northward of account, and fall into the Bristol Channel, or the N.W. of Scilly, which may be owing to the tide running 9 hours to the northward and only 3 to the southward. The frequent use of the deep-sea lead, and a close attention to the quality of the soundings, is absolutely necessary to prevent this. This unequal stream of tide begins about 14 leagues W. from Scilly. It first runs N.N.W., and continues to alter till it comes to the E.N.E., the flood-tide then ceases to run. The flood runs here, on the full and change days, until 7h. 40m., at which time it is nearly half-ebb at the Scilly Islands. The flowing of the tide is rather uncertain. About 7 leagues W.S.W. of Scilly it is known to flow till 4h. 25m., and in St. Mary's Sound, Scilly, till 4h. 40m.

When coming into the Channel in the night, or in thick weather, you should not at any time come nearer to Scilly than 60 fathoms, nor to the Lizard than 46 fathoms. Off the Lizard, in mid-channel, the stream of tide runs to the eastward, on the full and change days of the moon, until 7h. 55m., or until it is half-ebb by the shore; it then changes, and runs to the westward, until it is half-flood by the shore.

**Course abreast of Scilly.**—After you are abreast of Scilly, and to the southward 5 or 6 leagues, the course to the same distance off the Lizard is E. by S.  $\frac{1}{4}$  S., 15 leagues: then haul in and make the land.

**From the Lizard to the Start.**—The course from the Lizard to the Start is E.  $\frac{1}{4}$  S., 21 leagues. In running up go not into less water than 40 fathoms, for 35 fathoms is in the stream of the Eddystone; neither go without the depth of 46, when as far as the Eddystone; in this depth of water you will have black sand, with small brown stones and shells, abreast of Scilly; and in the same depth abreast of the Lizard, branny sand and shells, or slaty small stones and black shells, the Lizard bearing N.N.E., 4 or 5 leagues.

**From the Start to Portland.**—From the Start to Portland the course is East, distant 16 leagues. Here you may run up between 30 fathoms in-shore to 36 or 38 fathoms to the southward, most part sand with shells; but if you are inwardly in 26 or 25 fathoms, you will have oaze and sand.

Between the Lizard and the Eddystone you may stand towards the shore into 40 fathoms, and off to 46. As there are 35 fathoms in the stream of the Eddystone, you will, by keeping without that depth, go quite clear of that danger. Abreast of the Eddystone, in mid-channel, the flood runs to the eastward, on full and change days, until 9 o'clock.

From the Eddystone to the Start you may stand towards the shore into 32 fathoms, and off to 46. Within half a mile of the Start Point are 15 fathoms. At 8 miles to the southward of the Start lies Start Knoll, with 29 fathoms on it, and 37 fathoms very near it on both sides.

Between the Start and Portland you may stand towards the shore into 30 fathoms, and off to 36. By not standing further to the southward than 36 fathoms, you will avoid the strong indraught between the islands Guernsey, Jersey, &c. Off the bill of Portland the flood runs to the eastward on the full and change days until 10h. 15m.

**From the Start to Dunnose** the course is E.  $\frac{1}{4}$  S., 32 leagues, where you will have 30 to 32 fathoms as high as Portland: after which approach no nearer to the shore than 22 fathoms, especially when you are above the high land of St. Alban's, as with strong winds southerly, or in little winds, the tide of flood sets directly in for Christchurch, the Needles, and Freshwater Bay, as described in the particular directions for the harbours in the Channel. When you stand towards the Isle of Wight, in thick weather and light winds, you should keep your lead going, the neglecting of this precaution has been the loss of many a ship.

**Dunnose to Beachy Head.**—In running up from Dunnose to Beachy Head, keep within to 18 fathoms, and without to no more than 28; but off the head you will have 17 and 18 fathoms 5 or 6 miles from the shore. The course up from 5 miles without Dunnose to the same distance off Beachy is E. by S., 55 miles.

**Beachy Head to Dungeness.**—From Beachy Head to Dungeness the bearing and distance are E.  $\frac{1}{4}$  N.,  $9\frac{1}{2}$  leagues; but Beachy Head must not be brought to the westward of N.W.  $\frac{3}{4}$  W., until you are  $2\frac{1}{2}$  leagues to the eastward of it, in order to clear the light-vessel lying off the southern head of the Royal Sovereign Shoals.

**Dungeness to the South Foreland.**—From Dungeness to the South Foreland the course and distance are E.N.E.,  $6\frac{3}{4}$  leagues: keep no further off than 16 nor closer in than 14 or 12 fathoms.

In coming up the Channel, after you are as high as the Start, if the land has not been previously seen, endeavour to make the coast of England, to avoid the Island of Alderney, the Caskets, &c.; but if you cannot safely do so, with a scant southerly wind, when the tide, both ebb and flow, has an inclination into every bay upon the coast, then keep your lead constantly going; and if you fall into deep water, from 50 to 60 fathoms or more, coarse ground, you are somewhere near the stream of the Caskets, and must run to the northward, into 40 or 35 fathoms, sand and shells; you will then be to the northward of them, and in a fairway.

Being too far to the southward, and mistaking the Caskets light at first sight, for those of Portland, has occasioned the loss of many ships upon adjacent dangers. The alarm-bell, established near the Casket light, may be heard at a great distance.

Should a vessel make the light on Hanois, 1 mile off the S.W. Point of Guernsey, it may be readily known from the Caskets, as it only shows one red light, revolving every forty-five seconds and seen round the western horizon. The Caskets bear N.E. by E.,  $21\frac{1}{4}$  miles from this light.

The pit or gully, called Hurd's Deep, is an excellent guide to ship's working up or down Channel in dark, hazy weather. In the W. end of this Deep, at 4 leagues to the westward of and in the parallel of the Caskets, there are 58 fathoms, coarse ground; and within  $1\frac{1}{2}$  mile of it, to the eastward and westward, 37 and 36 fathoms, sand. The gully extends from thence to the E.N.E., and E.S.-eastward, 10 leagues, and then takes a turn rather suddenly to N.N.E. more than 2 leagues, and is more than 2 miles wide being of a serpentine shape. At 4 leagues E.N.E.  $\frac{1}{2}$  E. from the W. end are 48 fathoms; this is 8 miles to the northward of the Caskets; and there are 45 to the northward, and 38 to the southward of it. N.E. by N., nearly 10 miles from the Caskets, there are 72 fathoms, coarse ground, and 39 fathoms, sand, to the southward. Further eastward there are 62, 54, and at its extremity 50 fathoms, all coarse ground; and to the northward and westward of it, 10 fathoms less in every part; so that a ship from the northward, increasing the depth 10 fathoms suddenly, may be assured of being within 10 miles of the Caskets, Alderney, or Cape La Hague.

**Caskets.**—The Caskets bear from the Start S.E.  $\frac{1}{2}$  S., distant 19 leagues, and from the Bill of Portland, S. by W.  $\frac{1}{4}$  W., 16 leagues.

Between the Bill of Portland and Dunnose you may stand toward the shore into 22 and off to 35 fathoms by not standing into less than 22 fathoms, you will keep without the indraughts of the Needles and Freshwater Bay. When you stand towards the Isle of Wight, in thick weather and light winds, you should keep your lead going constantly, because you may, from the depth of 22 fathoms, suddenly get into 18, and then 30 or 40, or more within  $1\frac{1}{2}$  mile of St. Catherine's Point. In standing off from the Isle of Wight, at about 6 leagues from the island, the depth will be found to increase rather suddenly from 30 to 33 fathoms, to 39 or 40 fathoms, this is in the N. side of the North Deep, which extends from abreast of Christchurch Head to above Brighton, at the distance of 5 or 6 leagues from the coast. It is of various breadths, from 2 to 5 leagues, and has throughout coarse ground, with from 4 to 10 fathoms greater depth than will be found between it and the land. By giving proper attention to these particulars in thick weather, the distance from the English Coast may be nearly ascertained. To the S.-westward of this is another, called the West Deep, of about 11 leagues in extent, E. and W., and from

2 to 3 leagues in breadth, having from 37 to 45 fathoms; its W. end is 2 leagues eastward from the N.E. end of Hurd's Deep; and its S. edge is 4 leagues from Cape Barfleur. Further to the eastward is the South Deep, with from 32 to 36 fathoms; between it and the North Deep are 28 and 29 fathoms. Off Dunnose, in mid-channel, the stream of flood runs to the eastward, on full and change days, until 10h. 45m.

Between Dunnose and Eastborough, or Barrow Head, you may stand towards the shore into 10 fathoms, and off to 30. In light winds and thick weather, it will be necessary to keep your lead going when standing towards the Owers.

In approaching the Owers light-vessel, go no nearer in passing than  $1\frac{1}{2}$  mile, until you have brought it to bear N. (A description of this light-vessel and the Owers is contained in page 35.)

If it be necessary to run into Selsea Park for shelter, with contrary winds, pass to the eastward of the light-vessel, and afterwards be sure not to bring it to the southward of S.W. by S.; until you have passed the black buoy off Eastborough, or Barrow Head, keep your lead going, and when  $2\frac{1}{2}$  miles N.E. of it, you may steer for the anchorage in the Park.

Between Eastborough Head and Beachy, you may stand towards the shore into 18 fathoms, and off to 28. The former depth will carry you far enough off Beachy Head to clear the shoals which lie to the eastward of it. (See page 28.) Here the stream runs to the eastward, on full and change days, until 11h. 45m.

Between the shoals which lie off Beachy Head and Dungeness, you may stand toward the shore into 12 fathoms, and off to any convenient distance, according to circumstances, taking care not to go further from the land than 5 leagues, in order to avoid the Western Vergoyer, Ridens of Boulogne, &c., described in page 20. As the soundings hereabout are very irregular, we refer the mariner to the chart for the necessary information; observing only that, by not standing nearer the shore than 12 fathoms, he will go clear of the shoals which lie to the westward and eastward of the Ness Point. Here the stream runs to the eastward, on full and change days, until 1h. 45m.

Between Dungeness and the S. Foreland, after you are to the eastward of the rocky shoal which lies to the westward of Folkestone, you may stand towards the shore into 12 fathoms, and off to 16. By not standing further off than 16 fathoms, you will keep clear of the Varne, which, with the Ridge, is described in page 19.

When going between Dover and the Downs, observe, that 17 fathoms will carry you without the S. Sand Head; that 13 fathoms will lead you within it; and that 15 fathoms is in the stream of it. The S. Sand Head light-vessel is moored in 13 fathoms at low water.

**TIDES.**—When approaching the English Channel westward of a line joining Ushant and Scilly,—the outer streams set between N. and E., while the water is falling at Dover, and between S. and W. while it is rising.

Between the line from Ushant to Scilly as far as the line joining the Start and Caskets, there is a mixed tide, partaking of the joint direction of the Channel and offing streams.

As soon as a vessel passes to the eastward of the Start and Caskets she gets into a true Channel stream, which sets straight up and down Channel in the fairway, and will carry a vessel always towards Beachy Head while the water is rising at Dover, and from it while it is falling there.

## ON THE NAVIGATION OF THE CHANNEL BY STEAM VESSELS.

It is of considerable importance that courses should be pursued by steamers navigating up and down channel in the night, so as to avoid as much as possible the general track of sailing vessels, especially those in the foreign trade for the [E. CHANNEL.]

safe conducting of which requires every necessary care in running during the night; and even when all possible precaution is taken, it requires an experienced eye, only to be found in those used to navigate amongst shipping in the dark, to make out readily what a ship is about, how standing, &c., when suddenly coming upon her. Confusion in these cases is too often the consequence, therefore steamers should keep a track, used by coasters and themselves, if possible.

Leaving a position off the South Foreland, both lights in one, if passing pretty close under them, and then hauling in a little to pass near Dover, a W.S.W. course for 21 miles will carry you to Dungeness, just within the track of all large ships running up. Having the light bearing N., at a prudent distance, a W.  $\frac{3}{4}$  S. course for 28 miles will bring the cliff of Beachy Head to bear N.N.W.\* If blowing hard from the southward, a quarter of a point more should be allowed, care being taken to avoid the Royal Sovereign Shoals, now marked by a light-vessel.

Beachy Head may, however, be passed as near as convenient; and when it bears about N. by W., 8 miles distant, a W. by N.  $\frac{1}{4}$  N. course, for 62 miles, will carry you to a berth 5 miles off St. Catherine's Point, with the light bearing N.N.E. In this course you will pass the Owers light at the distance of 6 miles; but as the tide, both ebb and flood, has a tendency to set towards these shoals, care should be taken (if in spring-tides especially, and fresh S. breeze, you find the vessel nearer to the light than the course steered should take you) to keep out a little, to give the Isle of Wight a good berth. The distance at which you pass the Nab light also, if seen, which it will be if too far in, being a further guide for St. Catherine's Point, which, on a dark night, ought not to be approached without caution.

From abreast of St. Catherine's Point, the direct course to S. of the Start Point light will be W.  $\frac{1}{2}$  N., 90 miles; or, on a clear night, it will be better to edge in towards the Portland lights—say from St. Catherine's Point W. by N.  $\frac{1}{4}$  N., 45 miles, then W.  $\frac{1}{4}$  N., 45 miles, thus continuing the plan of keeping well within the line of large ships coming up Channel.

From 4 miles without the Start, W.N.W.  $\frac{1}{4}$  W., 54 miles, will take you to Falmouth, passing outside the Eddystone, from which the entrance of Falmouth is 30 miles. The light on St. Anthony's Point is not seen by vessels coming from the E., until you are close to it, being shut in under the point. The point on which the light-house stands may be passed very close; pilots pass it alarmingly close.

The COURSES UPWARD, from FALMOUTH to the SOUTH FORELAND, given as safe courses, are as follow:—

From Falmouth to off the Start, E.S.E.  $\frac{1}{4}$  S., or in fine weather E.S.E., 54 miles.

From the Start, bearing N. to Portland, E.  $\frac{1}{4}$  S. 48 miles.

Portland lights N. to Beachy Head, E. by S., 102 miles.

From Beachy Head, N., distant 7 or 8 miles, to Dungeness, E.  $\frac{3}{4}$  N., 31 miles; if you are within  $1\frac{1}{2}$  mile of Beachy Head, steer S.E. by E., 8 miles, then E.  $\frac{3}{4}$  N., 24 miles; if without that distance, do not shut in the light, until you judge yourself 3 leagues from it; or, in thick weather, come no nearer the Royal Sovereign Shoals than 15 or 16 fathoms.

Dungeness to S. Foreland, E.N.E., 21 miles.

**CAUTION.**—Captain Bullock, R.N., remarks, that accidents of a fatal nature have occurred to ships running up Channel by being lost on the coast of France, in the vicinity of Boulogne, which has been attributed to the rotary action of the stream; but there is more reason to believe that they have been set to the eastward of their reckoning, and deeming themselves westward of Dungeness have been steering E., whilst they have been 10 miles beyond it, when probably the stream to the S.W. has begun to run, and catching them on the port bow, has set them over to the French shore. The mariner, therefore, will do well to study the set and turning of the stream, and on no account to neglect the lead.

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\* Beachy Head light is badly placed for steam navigation; coming from the eastward, it remains shut in so long, that it is impossible for a navigator, wishing, to keep the shore, to know when it should be opened.

**A TABLE OF MAGNETIC THWART BEARINGS IN THE  
ENGLISH CHANNEL,  
FROM COAST TO COAST, COMMENCING AT USHANT.**

Names of Places.	Magnetic Bearings.	Distance. Miles.
Ushant (W. end) to Bishop Light .....	N. $\frac{3}{4}$ W.	98
to the Lizard Lights.....	N.N.E.	89
Start Point .....	N.E. $\frac{3}{4}$ E.	120
Bill of Portland .....	N.E. by E. $\frac{1}{2}$ E.	162
St. Catherine's Point Light .....	E. by N. $\frac{1}{2}$ N.	196
Caskets .....	E. by N. $\frac{1}{4}$ N.	132
Bishop Light to I. de Bas Light, France.....	S.E. by S.	114
Hanois Point Lt., Guernsey .....	S.E. by E.	143
Caskets .....	S.E. by E. $\frac{3}{4}$ E.	157
Lizard Lights.....	E. by S. $\frac{1}{2}$ S.	48
Lizard Lights to Les Heaux Light .....	S.E. by S. $\frac{1}{2}$ S.	102
Hanois Point Light .....	S.E. $\frac{3}{4}$ E.	101
Caskets .....	S.E. by E. $\frac{1}{2}$ E.	108
Start Point .....	E. $\frac{1}{2}$ S.	63
5 m. S. of St. Catherine's Pt. ....	E. $\frac{3}{4}$ S.	150
Beachy Head.....	E. $\frac{3}{4}$ S.	212
Start Point to Les Heaux Light.....	S. $\frac{1}{2}$ W.	80
Hanois Light.....	S. by E. $\frac{1}{2}$ E.	60
Caskets .....	S.E. $\frac{1}{2}$ S.	56
3 miles N. of Cape Barfleur .....	S.E. $\frac{1}{2}$ E.	95
Bill of Portland .....	East.	49
St. Catherine's Point.....	E. $\frac{3}{4}$ S.	92
Dieppe .....	S.E. by E. $\frac{3}{4}$ E.	180
Cape d'Alprech .....	E. by S.	198
Bill of Portland to the Caskets .....	S. by W. $\frac{1}{2}$ W.	47
Cape la Hague.....	South.	49
Cape Barfleur .....	S.S.E.	66
Cape la Hève .....	S.E. $\frac{1}{2}$ S.	113
Dieppe .....	S.E. by E.	137
Bill of Portland to St. Catherine's Point...	E. by S. $\frac{1}{4}$ S.	44 $\frac{1}{2}$
St. Catherine's Point to Cape Barfleur.....	S. by W. $\frac{3}{4}$ W.	53
Cape la Hève .....	S. by E. $\frac{3}{4}$ E.	82
Dieppe .....	S.E. $\frac{1}{4}$ E.	100
Cape d'Alprech ...	E. by S. $\frac{1}{4}$ S.	108
Beachy Head .....	E. by S.	60
Owers Light-vessel to Cape Barfleur .....	S.W. $\frac{1}{4}$ S.	60
Cape la Hève .....	South.	74
Dieppe .....	S.E. $\frac{3}{4}$ S.	80
Cape d'Alprech ...	E. by S. $\frac{1}{2}$ S.	85
Beachy Head .....	E. by S.	35 $\frac{1}{2}$
Beachy Head to Cape la Hève .....	S.S.W. $\frac{1}{4}$ W.	73
Dieppe .....	S. by E. $\frac{1}{4}$ E.	58
Cape d'Alprech .....	E.S.E.	50
Varne Light-vessel .....	East.	41
Cape Grisnez .....	E. $\frac{3}{4}$ S.	51
Dungeness .....	E. $\frac{1}{2}$ N.	29 $\frac{1}{2}$
Dungeness to Dieppe .....	S. by W. $\frac{1}{4}$ W.	60
Cape d'Alprech.....	S.E. $\frac{1}{4}$ S.	25
Cape Grisnez .....	S.E. by E. $\frac{3}{4}$ E.	22 $\frac{1}{2}$
Varne Light-vessel.....	E. by S.	12

## LIGHTHOUSES AND LIGHT-VESSELS,

With the Pages of the Work, wherein they are more fully described.

Name of Light.	Place.	Fixed or Revolving.	Page.
<b>GOODWIN SAND.</b>			
<b>COAST OF ENGLAND.</b>			
North Sand Head Lt.-vessel	Off the N. end of Sand .....	1 Revolving ...	9
Gull Stream Light-vessel ..	In the Fairway .....	1 " .....	10
South Sand Head Lt.-vessel	Off the S. end of Sand .....	1 Fixed .....	10
East Goodwin Lt.-vessel...	Off E. side of Sand.....	1 Revolving ...	11
Deal .....	On Iron Pier .....	1 Fixed .....	12
South Foreland.....	On the Head .....	2 " .....	13
Ramsgate .....	W. Pier-head .....	1 " .....	12
" .....	E. Pier-head .....	1 Flashing .....	12
" .....	On West Cliff .....	1 Fixed .....	12
" .....	On W. end of Wellington Crescent	1 " .....	12
Varne Light-vessel .....	Off S.W. end of Sand.....	1 Revolving ...	17
<b>COAST OF FRANCE.</b>			
Cape Grisnez.....	$\frac{1}{2}$ m. S. of Cape .....	1 Revolving ...	18
Boulogne .....	2 S.W. Jetty, 1 N.E. do.....	3 Fixed .....	19
Point d'Alprech.....	Near Old Semaphore.....	1 Flashing .....	21
Point L'Ornel .....	On the Point .....	1 Fixed .....	21
Point Touquet .....	S. side of Canche R.....	2 " .....	21
<b>COAST OF ENGLAND.</b>			
Dover .....	Extremity of Admiralty Pier .....	1 Flashing .....	21
" .....	S. Pier .....	3 Fixed .....	22
" .....	N. Pier .....	1 " .....	22
" .....	Near Granville Dock .....	1 " .....	22
Folkestone, S. pier .....	S. Pier-head.....	2 " .....	23
" .....	New Pier .....	1 " .....	23
Dungeness .....	On the Point .....	1 " .....	23
" .....	Outer Light.....	1 Flashing .....	24
Rye .....	N. side of Entrance.....	4 Fixed .....	24
" .....	W. side of Entrance .....	1 " .....	24
Hastings.....	Upper light in the town; lower on the beach .....	2 " .....	25
Royal Sovn. Shoals Lt.-ves.	Off Southern Head.....	1 Revolving ...	26
Eastbourne .....	End of new Pier.....	1 Fixed .....	25
Beachy Head.....	Belletoute Cliff .....	1 Revolving ...	28
Newhaven .....	W. Pier .....	2 Fixed .....	29
" .....	E. Pier .....	1 " .....	29
Brighton.....	Chain Pier-head .....	1 " .....	30
" .....	New Pier-head .....	1 " .....	30
Shoreham .....	Within the entrance of the Harbour	2 " .....	30
Worthing .....	On Pier.....	1 " .....	33
Little Hampton .....	N. end of the Eastern Pier .....	1 " .....	33
Owers Light-vessel .....	E. end of the Shoals .....	1 Revolving ...	35
Southsea.....	In the Castle .....	1 Fixed .....	42
Nab Light-vessel .....	Off the point near the Nab Rock...	2 " .....	43
Warner Light-vessel .....	E. part of Shoal .....	1 Revolving ...	43
Spit Sand, Horse Sand, No-			
Man's Land, Brading			
Haven, Sea Forts .....	Small lights.....	Fixed .....	41
Stokes Bay .....	End of Pier .....	2 " .....	47
Calshot Light-vessel.....	Off Calshot Castle .....	1 Revolving ...	50
Yarmouth .....	On the Quay .....	2 Fixed .....	51
Southampton.....	Royal Pier and Dock Piers .....	2 " .....	52
" .....	Netley and River Itchin .....	2 " .....	52
Hurst .....	On the beach of Hurst Point .....	2 " .....	53
Isle of Wight.....	On the Needles Outer Rock .....	1 " .....	54
Poole .....	N. side of Entrance.....	2 " .....	57



## LIST OF LIGHTS.

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Name of Light.	Place.	Fixed or Revolving.	Page.
St. Catherine, Isle of Wight	On the Point .....	1 Fixed .....	58
Weymouth .....	On the N. Pier and the beach .....	4 " .....	59
Portland .....	On the Breakwater .....	1 " .....	59
" .....	Near the Bill .....	2 " .....	59
Shambles Light-vessel .....	Off E. end of Shoal .....	1 " .....	60
Lyme Regis .....	Inner Pier-head and Custom House .....	2 " .....	61
Teignmouth .....	S.W. end of the Denn .....	1 " .....	63
Torquay .....	On Pier-heads .....	2 " .....	63
Brixham .....	Pier-head .....	2 " .....	64
Dartmouth .....	Kingswear, N. side .....	2 " .....	66
" .....	S. part of town .....	1 " .....	66
Start Point .....	140 yards inside of the S.E. extreme of the Point .....	1 Revolving and Fixed .....	67
Eddystone .....	On the Rock .....	1 Fixed .....	70
Plymouth .....	On W. end of Breakwater .....	2 " .....	71
" .....	At Mill Bay .....	1 " .....	74
" .....	W. Barbican Pier-head .....	1 " .....	74
Falmouth .....	St. Anthony Point .....	1 Revolving and Fixed .....	81
" .....	Prince of Wales' Breakwater .....	1 Fixed .....	
Lizard .....	On the Cliff .....	2 " .....	86
Penzance .....	Pier-head S. Arm .....	1 " .....	89
Wolf Rock .....	On the Rock .....	1 Revolving .....	92
Longships .....	On the Rock off Land's End .....	1 Fixed .....	92
St. Ives .....	On Pier-head .....	2 " .....	101
Hayle .....	On Lelant Sand-hills and on Quay .....	3 " .....	101
Godrevy .....	On the Island .....	1 Revolving and Fixed .....	102
Padstow .....	Quay-head .....	1 Fixed .....	103
Trevose Head .....	On N.-western part .....	2 " .....	103
SCILLY ISLES.			
St. Agnes' Rock .....	Summit of the Island .....	1 Revolving .....	94
Bishop Rock .....	On the Rock .....	1 Fixed .....	94
Seven Stones Light-vessel .....	E. side of the Rocks .....	2 " .....	95
COAST OF IRELAND.			
Bantry Bay .....	On Roanecarrig Island .....	1 Fixed .....	107
Fastnet Rock .....	On Summit .....	1 Revolving .....	110
Crookhaven .....	N. side of Entrance .....	1 Fixed .....	110
Galley Head .....	On the Point .....	1 Revolving .....	114
Kinsale .....	On the Head .....	1 Fixed .....	115
" .....	Fort Charles E. side of Harbour .....	1 " .....	115
Cork Harbour .....	Roche Point E. side of Entrance .....	1 Revolving .....	117
" .....	E. Elbow of Spit Bank, off Queens-town .....	1 Fixed .....	117
Ballycotton .....	Outer Island .....	1 Revolving .....	119
Youghal .....	W. side of entrance .....	2 Fixed .....	122
Minehead .....	S. side of Head .....	1 Revolving .....	122
Dungarvan .....	Ballynacourty Point .....	1 Fixed .....	122
Waterford Harbour .....	Hook Tower, E. side of entrance .....	1 " .....	125
" .....	In Duncannon Fort, E. side of Channel .....	2 " .....	125
" .....	Half a mile N.N.E. & E. of the Fort .....	1 " .....	125
" .....	Dunmore Pier-head, W. side of entrance and River Suir .....	2 " .....	126
Saltee Light-vessel .....	Off Coningbeg Rock, the southern-most of the Saltee Islands .....	2 " .....	128
Tuskar .....	On the Rock .....	1 Revolving .....	129
COAST OF FRANCE.			
Ushant .....	N.E. Point .....	1 Fixed .....	130
" .....	N.W. Point .....	1 Revolving .....	130

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